

GEORGIA IMMUNIZATION STUDY

2004 Final Report



Georgia Department of Human Resources
Division of Public Health
Epidemiology Branch
Prevention Branch, Immunization Program
Nineteen Public Health Districts

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A profound thank you and sincere appreciation is also given to the private and non-public health providers and the Vaccines for Children providers that participated in this collaborative effort. Their cooperation and assistance throughout the study is greatly appreciated.

We would also like to thank the Rollins School of Public Health at Emory University for providing us with the study materials. Their generosity allowed us to continue repeated assessments each year and compare our efforts with theirs.

A special note of thanks to Mr. Mike Chaney, Georgia Immunization Program Manager, for his support and leadership during this study.

2004 Executive Summary

The 2004 Immunization Study was conducted by the Georgia Department of Human Resources, Division of Public Health, Epidemiology Branch, Immunization Program and Public Health Districts. However, this study could not have been conducted without the assistance of the private providers, non-public health providers and the Vaccines for Children providers that contributed in this collaborative effort. Their cooperation and assistance throughout the study is greatly appreciated.

The Immunization Study employs a non-experimental retrospective cohort research design in order to ascertain the immunization coverage rate for children born in the State of Georgia. This study design allows for the calculation of immunization rates for children who turned two in January 2004. Identifying information about the children and their parents was collected from birth certificates.

The Immunization Study showed that during 2004 most childhood immunizations (70 percent) were administered in the private sector, while County Health Departments immunized 14 percent, and the sources for 15 percent are unknown. The proportion of children in Georgia who have received all of the recommended vaccinations increased steadily from 16 percent in 1997 to 78 percent in 2002, a slight decrease in 2003 to 74 percent, but an increase in 2004 to 81 percent.

Acute infection with Hepatitis B causes severe disease in only a small proportion of those infected, but it can lead to chronic infection, cirrhosis, and cancer of the liver. In Georgia in 2004, 93 percent of infants had received two doses of hepatitis B vaccine by 12 months of age, and, at 24 months, 91 percent of children had received the recommended three doses.

Vaccines have largely controlled diphtheria, measles, pertussis, and other scourges of the past. In 1923, with a population of less than three million, Georgia recorded 274 deaths from diphtheria, 347 deaths from measles, and 254 deaths from pertussis, while in 2003, just 80 years later, and with a population that has almost tripled, Georgia had no reported cases of tetanus or diphtheria, and just 36 cases of pertussis. In 2004, 85 percent of children 12 months of age were appropriately immunized against diphtheria, tetanus and pertussis, and 81 percent of Georgia's two-year-olds were adequately immunized against ten vaccine-preventable childhood diseases (diphtheria, tetanus, pertussis, hepatitis B, *H. influenzae* type B, mumps, measles, rubella, polio and varicella).

There was considerable variation from district to district in the proportion of two-year-olds reported to be fully immunized, ranging from 65 percent in the Clayton district to 100 percent in the North (Gainesville) district. Eleven of the state's public health districts (Dalton, Gainesville, Gwinnett, Brunswick, Macon, Augusta, Columbus, Valdosta, Albany, Savannah, and Athens) succeeded in immunizing at least 85 percent of their two-year-olds against the 10 vaccine-preventable childhood diseases. Only the Clayton district had a rate less than 75 percent. Within Metropolitan Atlanta, the immunization rates varied from 65 percent in Clayton to 94 percent in Gwinnett. In

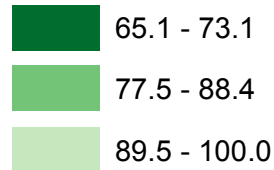
Georgia outside Metropolitan Atlanta, the immunization rates ranged from 77 percent in LaGrange to 100 percent in the Gainesville district (see Map below).

There was minor variation in immunization status of children by the race and education of their mothers, and by whether their mothers were Medicaid recipients. Among children of white women, 87 percent were adequately immunized, while among children of black women, 82 percent were adequately immunized. Children of college-educated mothers were less likely to be adequately immunized (84 percent) than children of mothers with less than high school education (87 percent). The children of mothers who did not receive Medicaid were more likely to be adequately immunized (87 percent) than were children of mothers who did receive Medicaid (84 percent).

Georgia Vaccination Rates (4:3:1) by Public Health District 2004

PUBLIC HEALTH DISTRICTS

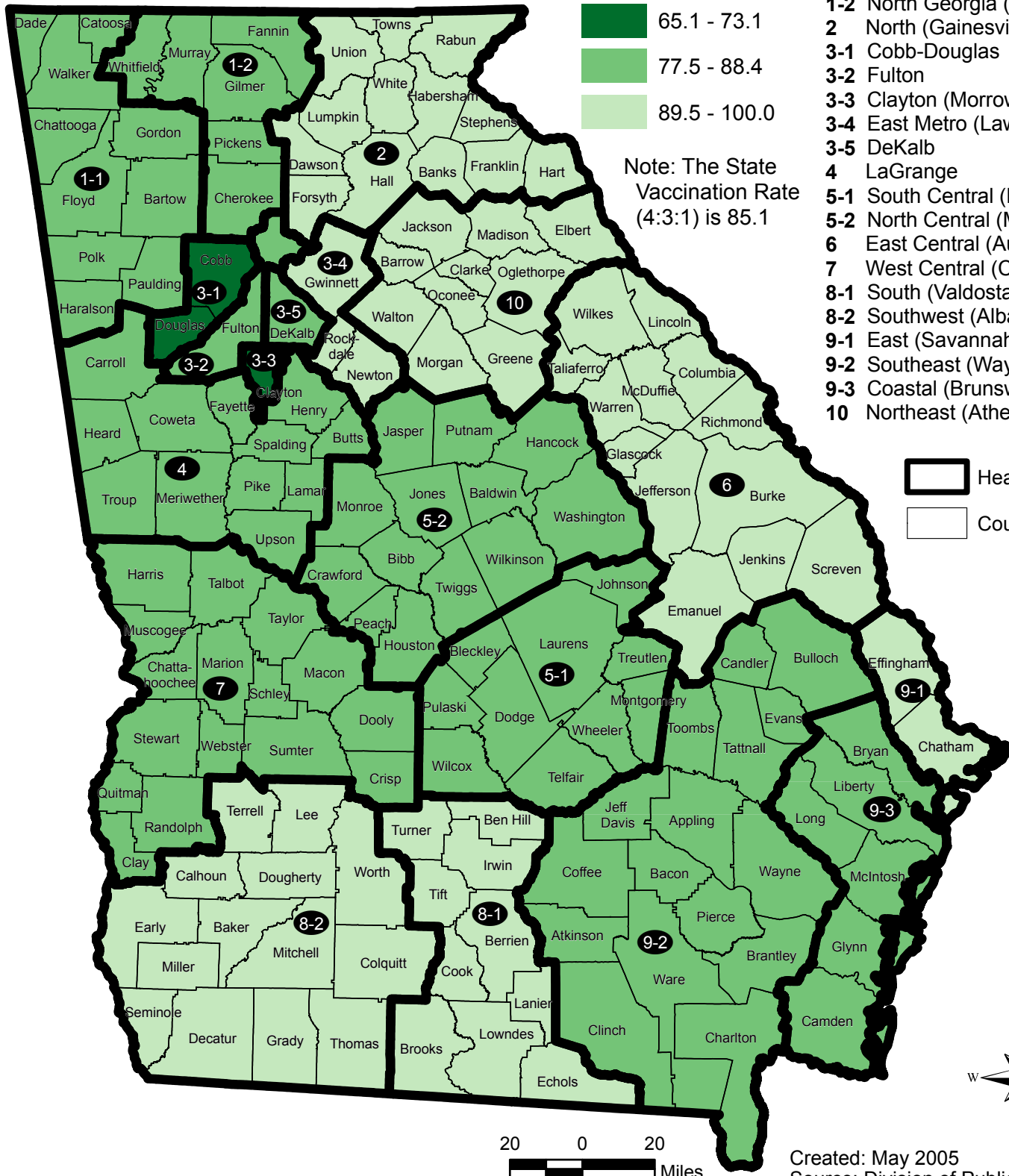
Vaccination Rate



Note: The State
Vaccination Rate
(4:3:1) is 85.1

- 1-1 Northwest (Rome)
- 1-2 North Georgia (Dalton)
- 2 North (Gainesville)
- 3-1 Cobb-Douglas
- 3-2 Fulton
- 3-3 Clayton (Morrow)
- 3-4 East Metro (Lawrenceville)
- 3-5 DeKalb
- 4 LaGrange
- 5-1 South Central (Dublin)
- 5-2 North Central (Macon)
- 6 East Central (Augusta)
- 7 West Central (Columbus)
- 8-1 South (Valdosta)
- 8-2 Southwest (Albany)
- 9-1 East (Savannah)
- 9-2 Southeast (Waycross)
- 9-3 Coastal (Brunswick)
- 10 Northeast (Athens)

- Health Districts
- Counties



Created: May 2005
Source: Division of Public Health
Classification: Natural Breaks
Projection: Georgia Statewide
Lambert Conformal Conic
Note: Map originally printed in color

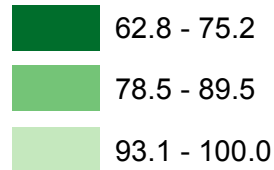


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Georgia Vaccination Rates (4:3:1:3:3:1) by Public Health District 2004

PUBLIC HEALTH DISTRICTS

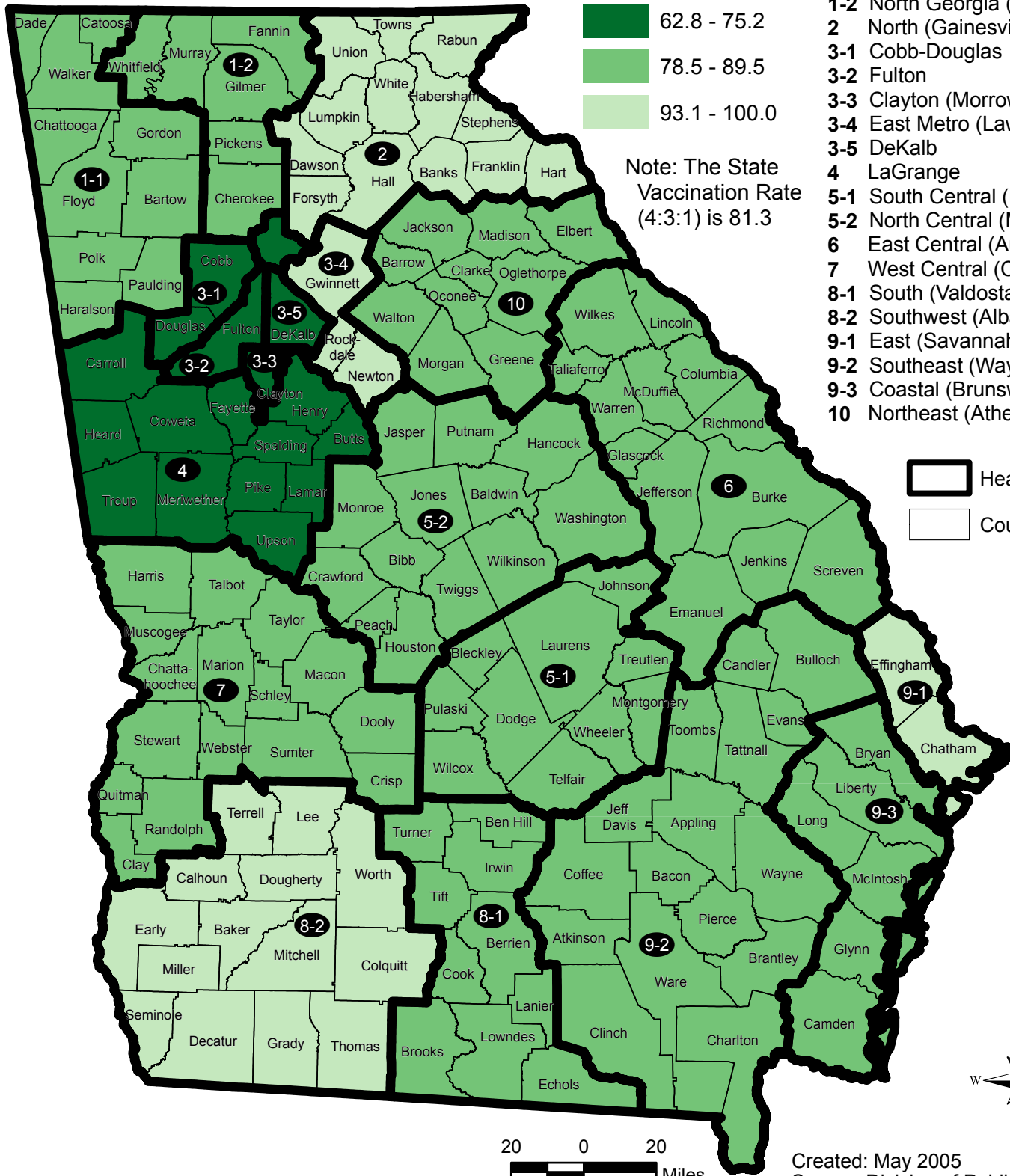
Vaccination Rate



Note: The State
Vaccination Rate
(4:3:1) is 81.3

- 1-1 Northwest (Rome)
- 1-2 North Georgia (Dalton)
- 2 North (Gainesville)
- 3-1 Cobb-Douglas
- 3-2 Fulton
- 3-3 Clayton (Morrow)
- 3-4 East Metro (Lawrenceville)
- 3-5 DeKalb
- 4 LaGrange
- 5-1 South Central (Dublin)
- 5-2 North Central (Macon)
- 6 East Central (Augusta)
- 7 West Central (Columbus)
- 8-1 South (Valdosta)
- 8-2 Southwest (Albany)
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SECTION I:

PROJECT OVERVIEW

SECTION I: PROJECT OVERVIEW AND INTRODUCTION

The Division of Public Health, Epidemiology Branch, Immunization Program and Health Districts collaborated on the 2004 Georgia Immunization Study. The purpose of the study was to assess the immunization coverage rates of two-year-old children in Georgia statewide and for each of the nineteen health districts.

The Georgia Immunization Survey is now in its eighth year. The Rollins School of Public Health, Emory University did the first three years of the study and the Georgia Division of Public Health has continued on with the survey for the remaining five years. Immunization data for each year of the study evaluate rates for children born two years before the beginning of the study. In 2004, immunization rates for children born in January 2002 were examined. The current rates are compared throughout this report with data from the previous four years of the study.*

Public health representatives in each of the nineteen health districts collected immunization data from both public and private health care providers. The Principal Investigator and Project Coordinator was Carol A. Hoban, MS, MPH., the Project Assistant was Ms. Rebecca Thompson and Ms. Valerie Jones was the Project Associate.

Staff at the Georgia Division of Public Health began work on the Georgia Immunization Project in November 2002. During December 2002, the sampling procedure was completed, and revisions were made to the data collection form and training manual. Letters were sent to each district health director informing them about the study. Each Vaccines For Children provider in Georgia (approximately 700) received a letter and supporting information about the study during the month of January 2004.

* Throughout this report, we refer to study years one, two, three, four and five as, 1999-2000, 2001, 2002, 2003, and 2004 respectively. The results from these five study years refer to rates for 1998, 1999, 2000, 2001, and 2002 respectively.

During January, a training session for the public health representatives was held via conference call. Data were collected from February 2004 through September 2004. (Data collection continued on some difficult to obtain records through the end of October 2004). The Project Coordinator served as the contact person for the public health representatives during the data collection period. Conference calls were held monthly with the public health representatives to answer questions and address concerns regarding data collection.

Table 1 describes project activities that took place throughout the project timeline.

Table 1:
Project Activity Timeline

Project Activity	Date
Original, stratified sample drawn	December, 2003
Initial notification of public health community Immunization Coordinators Health Directors	December, 2003
Initial notification of private health community	January, 2004
Conference call training for public health representatives	January, 2004
Data collection period	February – September, 2004
Data entry period	March – November, 2004
Double data entry of 5% of data forms	January, 2004
Final data cleaning and analysis of data	February, 2004
Final Report	March, 2004

Data collection was extended beyond September 2004 to allow for follow-up of records for which the public health representatives had some information but needed more time to complete.

This Final Report includes both statewide and health district level immunization analyses. It contains an overview of data collection, sampling methodology, and a discussion of the study findings. Additional reports on related topics are discussed in Appendices D, E, and F. Findings specific to Varicella are discussed in Appendix D. A report on the immunization site (public or private provider) is included in Appendix E. Margins of error for immunization coverage rates are included in Appendix F.

SECTION II:

METHODOLOGY

SECTION II: METHODOLOGY

Research Design

The eighth year of the Georgia Immunization Study employed a non-experimental retrospective cohort research design in order to ascertain the immunization coverage rate for children born in the State of Georgia in January 2002. In this retrospective study, all of the immunizations should have occurred prior to the initiation of the project. However, during the data collection time period children that were not up-to-date on all immunizations were allowed to receive their shots. The study design allowed for the calculation of immunization rates for children who turned two in January 2004. Identifying information about the children and their parents was collected from birth certificates.

Target and Sample Populations

The target population of the seventh year of the Georgia Immunization Study included all two-year-old children born in the State of Georgia in 2002. A sample size of 4,116 children born in the month of January 2002 was selected for the study. The sample design allowed for independent estimates for each of the 19 health districts in the state. (See Appendix A for a description of the sampling plan.) The final estimate for the state is based on weighted data to account for differential probabilities of selection for each health district.

Dr. John Carter, Epidemiologist and Assistant Professor at the Rollins School of Public Health, drew a stratified random sample (by health district) from the total births in the state for January 2002. Information for each child, including all birth certificate variables available, was downloaded into an ASCII file. Examples of the type of birth certificate information obtained for each child include:

- ❖ Health district of birth
- ❖ County of birth
- ❖ Infant's first, middle, and last name
- ❖ Infant's sex

- ❖ Infant's date of birth
- ❖ Infant's address
- ❖ Medicaid status of mother at birth of child
- ❖ Mother's first, middle, and last name
- ❖ Father's first, middle, and last name (if available)
- ❖ Mother's race
- ❖ Mother's level of education

Preparation for Data Collection

Public health representatives in each health district completed the data collection procedures. Division of Public Health staff trained the representatives via a conference call during January 2004. During this training, the public health representatives:

- ❖ received an overview of childhood immunizations
- ❖ learned the data collection process and locating methods
- ❖ were taught information on recording data on the data collection form
- ❖ were instructed in confidentiality and professional etiquette

This information as well as other pertinent details were defined in the Public Health Representative Training Manual presented to each representative at the training. This manual was developed by the staff at the Rollins School of Public Health in 1996-97, and has been revised and updated by the staff at the Georgia Division of Public Health for use in each subsequent study year.

Data Form Development

The Georgia Division of Public Health, Epidemiology Branch, revised the standardized data collection form developed by the staff at the Rollins School of Public Health. (See Appendix C for a copy of the data collection form.) The form followed the recommended schedule of childhood immunizations jointly approved by the Advisory Committee on Immunization Practices (ACIP), the American

Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP).

The data collection form contained four distinct sections to be completed by the public health representatives, and included identifying information from the child's birth certificate.

The section titled "Part A: Identifying Information" included the identifying information for each child as well as a code number to further identify each record. This section also included an area for the representatives to record any changes to identifying information (i.e., change of address).

The immunization dates for each particular vaccination were recorded in the section labeled "Part B: Immunization History." There were spaces available for five Diphtheria, Tetanus, Pertussis (DTP/DTaP) vaccines, four Polio (OPV/IPV) vaccines, two Measles, Mumps, Rubella (MMR) vaccines, five *Haemophilus Influenza* type B (Hib) vaccines, four Hepatitis B (Hep B) vaccines, two Varicella vaccines, and four Pneumococcal Conjugate (PCV) vaccines. The data collection form provided one extra space for each vaccine to accommodate instances where a child was over-immunized. In this section the representative also noted the location where each individual vaccine was given (Health Department, Private Physician, or Unknown). See Appendix E for a report of the "Provider of Immunizations" information.

The next section, "Part C: Tracking Log", provided space for representatives to chronicle all activities performed for each record. This section aided the representatives in their work by documenting where they were in the abstraction process at any point in time. The section also enabled the State staff to understand the steps necessary to find each child's immunization history and to clarify notations made by the representative in Part D of the form.

"Part D: Data Collection" is designed to track where the data were collected and the reason data abstraction ended for each individual record. This information was used to understand why the representative returned the record to the State and to determine if any evidence of the child was found.

Data Collection Protocol

Step #1: Search for immunization records at local health departments.

In this step, representatives reviewed computerized files or immunization cards for shot dates. Representatives also used these files to find updated contact information for families. Representatives were instructed to check with Women, Infants, and Children (WIC) offices, for updated contact information as well.

Step #2: Search for immunization records through the parent(s).

In this step, representatives used the contact information from the birth certificate or any updated contact information found at the health department to contact the parent. Representatives also used sources such as city phone directories, directory assistance, and the Internet to find current contact information for parents. Parents were then contacted by phone and letter and asked to provide an immunization history or the location of immunization information (i.e., the name of the doctor or clinic office). Representatives also sent consent forms to parents.

Note about Field Visits: In some cases, representatives made home visits to collect data. This practice was encouraged if the representative was comfortable with it.

Step #3: Search for immunization records through private physician(s).

In this step, representatives contacted private physicians and requested the child's immunization history. Most physicians provided the information by phone or fax, once a copy of the parent's consent form was received. Some provided the information with a verbal parental consent. Others cooperated by checking a list of children from the sample against their patient list. Some

physicians preferred that representatives visit their offices in person to collect the data. Representatives were instructed to collect the information by the method (e.g., phone, fax, personal visit) most convenient to the doctor's office. In most cases, nurses, office managers, and records clerks were the main contacts for representatives collecting data in private physician offices.

Representatives returned completed data collection forms to the Georgia Immunization Program on a weekly basis via United States (U.S.) mail. The returned forms were reviewed by staff for correctness and completeness. ("Completeness" here refers not to immunization status, but to *completion of the abstraction process*, i.e., that a representative did all he or she could do to document a child's entire immunization record.) If a form was incorrectly filled out or incomplete, the public health representative was contacted for clarification.

The immunization dates and location for each record were then entered into an Epi Info Version 6.04 data file. This program was developed specifically for this study in Year Two, revised in Year Three by Ms. Alperin, Co-Principal Investigator and again in subsequent study years by Ms. Hoban.

Data Entry

The principal investigator and project assistant reviewed each record prior to entry into the Epi Info database. Attempts were made to resolve any unclear information with the public health representative before data entry.

Data cleaning and double data entry were done in the month of January 2004. Five percent of the data were re-entered and correlated with the original forms to look for data entry errors and estimate the error rate for the final sample. A data reliability rate of approximately 96.0% was found.

Analysis Plan

The plan for the analysis was very similar to that used in the previous years. Additionally, trends from the previous five years of the study are shown in this Final Report. Epi Info was the main software program used to assess immunization coverage rates, and provide a measure of where the immunizations were given. The analyses include univariate, bivariate, and multivariate analyses to produce a clear description of the immunization status of two-year-old children in the State of Georgia.

SECTION III:

RESULTS OF STATEWIDE ANALYSES

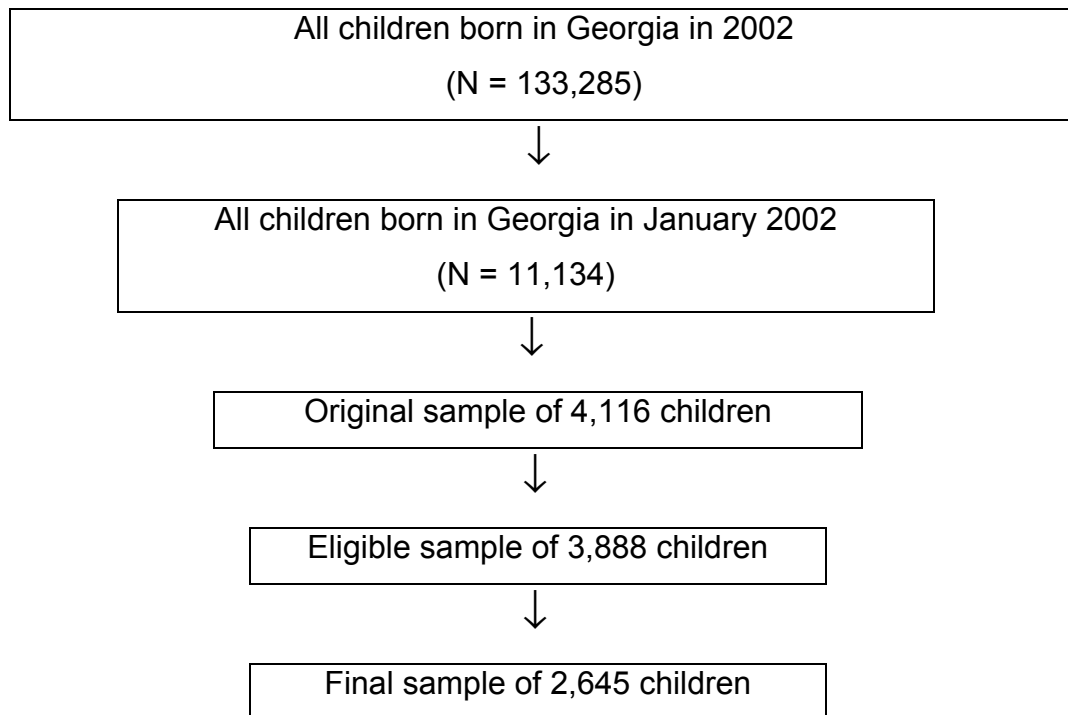
SECTION III: RESULTS OF STATEWIDE ANALYSES

Sampling

The sample of 4,116 children was drawn from 11,134 children born in Georgia in January 2002. A total of 133,285 children were born in Georgia during 2002.

Children who were ineligible for participation in the study were extracted from the original sample, leaving an eligible sample of 4,116. (Ineligible children were those who were deceased, adopted, moved out of state, or were known to be part of a military family.) Figure 1 below depicts the stages of the sampling procedure.

Figure 1: Sampling Procedure



Of the 3,888 children in the eligible sample, 2,645 children were located, 1,167 children never were located and 76 parental refusals were removed. The resulting final sample consisted of 2,645 children. The final sample represents the children for whom parental consent was given to have their child's

immunization record included in this study. The children who were never located were those for whom no evidence beyond the birth certificate could be found to confirm that the child existed. The final sample of 2,645 children represented 68 percent of the eligible sample.

Table 2:
Sample Description

Sampling Step	Number	Percent of Sample
Original Sample	4,116	100.0%
Deceased	4	0.1%
Adopted	13	0.3%
Moved out of state	135	3.3%
Military	76	1.8%
Eligible Sample	3,888	94.5%
Eligible Sample	3,888	100.0%
Records Not Located /Eligibility Unknown *	1,243	32.0%
Final Sample (Located Records**)	2,645	68.0%

* **Records Not Located / Eligibility Unknown** - This category refers to records where no evidence of a child's existence was found beyond birth certificate data (including those records where only one Hepatitis B shot was given at birth [n=15] or if a parent refused to participate in the study).

** **Located Records** – This category refers to all records where *evidence of a child's existence* was found, regardless of the child's immunization status. The supposition here, is that, if evidence of a child's existence was found, it is possible to also find documentation of that child's immunization status. This category includes records where:

- a) a provider refused to participate in the study;
- b) no immunization record was available due to documented religious objection;
- c) a provider could not be found (this implies contact with a parent, who would have provided evidence of the child's existence);
- d) no immunization record was available due to documented medical exemption;
- e) a parent could not be found, but shot dates were found elsewhere

Response Rates

Table 3 and Figure 2 depict the district and state response rates for the 2004 study. The response rates are the number of records located divided by the total number of records in the sample. Response rates provide some indication of the ease or difficulty of accessing records of the children in the study as well as the quality of data collection. As noted in the last column of Table 3, response rates are reported - using the eligible sample as the total. In reviewing the response rates based on the eligible sample, the district response rates range from a low of 38.9 percent to a high of 95.2 percent, with a statewide average response rate of 68.0 percent.

Table 3:

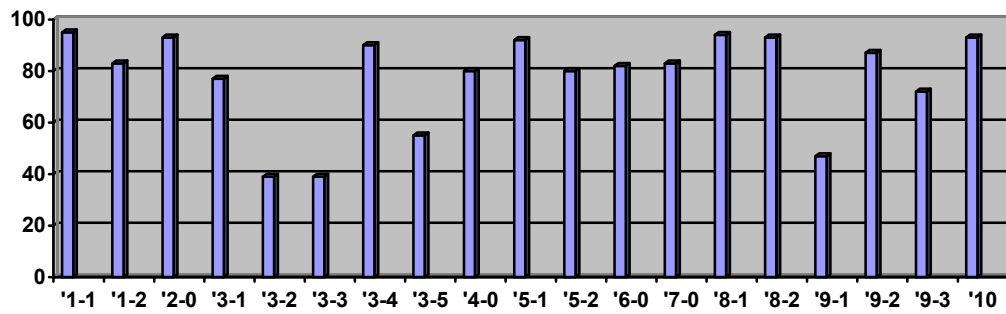
2004 Eligible Sample, Number Located and Response Rates by District

Health District	Eligible Sample (Number)	Number Located*	Response Rate ** (% of Eligible Sample located)
1-1	233	222	95.2%
1-2	136	113	83.1%
2-0	75	70	93.3%
3-1	294	225	76.5%
3-2	631	244	38.9%
3-3	218	86	39.4%
3-4	185	167	90.3%
3-5	435	240	55.2%
4-0	236	189	80.1%
5-1	60	55	91.7%
5-2	184	148	80.4%
6-0	142	116	81.7%
7-0	243	201	82.7%
8-1	81	76	93.8%
8-2	189	175	92.6%
9-1	173	81	46.8%
9-2	156	135	86.5%
9-3	117	84	71.8%
10-0	100	93	93.0%
State	3,888	2,645	68.0%

*sample includes parental refusals

**number located / eligible sample

Figure 2
2004 Response Rates by District



Georgia Health Districts

Parent Refusals by District:

Table 4 shows the number of parents who refused to participate in the study.

Table 4:
Parent Refusals by Health District for the 2004 Study

District	Number of Records Found	Parent Refusals	
		Number	Percent
1-1	222	4	0.02
1-2	113	11	0.10
2-0	70	3	0.04
3-1	225	13	0.06
3-2	244	18	0.07
3-3	86	0	0.00
3-4	167	14	0.08
3-5	240	1	0.00
4-0	189	2	0.01
5-1	55	1	0.02
5-2	148	1	0.01
6-0	116	0	0.00
7-0	201	2	0.01
8-1	76	0	0.00
8-2	175	0	0.00
9-1	81	0	0.00
9-2	135	0	0.00
9-3	84	1	0.01
10-0	93	5	0.05
Total	2,645	76	0.03

Parent refusals are defined as situations where the parent told the public health representative that he/she did not want to participate in the study.

Statewide Immunization Results

The immunization rates that were calculated for this report involved only the final sample of 2,645 children (children located). All reported immunization rates include information from both public and private providers. Since "adequate immunization status" is defined differently by different authorities, the Georgia Immunization Study has evaluated immunization status in several different ways:

- ❖ "4:3:1+3" status a child has received four DTP/DaTP, three OPV/IPV, one MMR, three Hib, three Hep B and one Varicella at anytime
- ❖ "4:3:1" status: used most frequently throughout the study, referring to the more traditional standard of immunization status -- a child who has received four DTP/DTaP, three OPV/IPV, and one MMR vaccination
- ❖ "3:3:1" status: used infrequently in this study - refers to a child who has received three DTP/DTaP, three OPV/IPV, and one MMR vaccination

Table 5 illustrates the percent of the children in the final samples in the last four years of this study who were adequately immunized with the 4:3:1+3 series compared to the children in the final sample who were not adequately immunized with this series.

Of the 2,645 children who were located in 2004, 81.3 percent were adequately immunized at the 4:3:1+3 level. This percent of adequately immunized children increased from 74.3 percent in 2003.

Table 5:
4:3:1+3 State Immunization Coverage by Study Year

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
1999-00	1,573	56.3	1,220	43.7
2001	1,837	66.7	918	33.3
2002	2,146	78.9	575	21.1
2003	1,906	74.3	661	25.7
2004	2,150	81.3	495	18.7

Note: State rates based on data weighted by health district.

Table 6 illustrates the percent of the children in the final sample who were adequately immunized with the 4:3:1 series compared to the children in the final sample who were not adequately immunized with this series. During the 2004 assessment, the number of adequately immunized children increased to 85.1 percent.

Table 6:
4:3:1 State Immunization Coverage by Study Year

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
1999-00	2,202	78.8	591	21.1
2001	2,068	75.1	687	24.9
2002	2,284	83.9	437	16.1
2003	2,075	80.8	492	19.2
2004	2,252	85.1	393	14.9

Note: State rates based on data weighted by health district.

Figure 3: Statewide Coverage
4:3:1 and 4:3:1+3

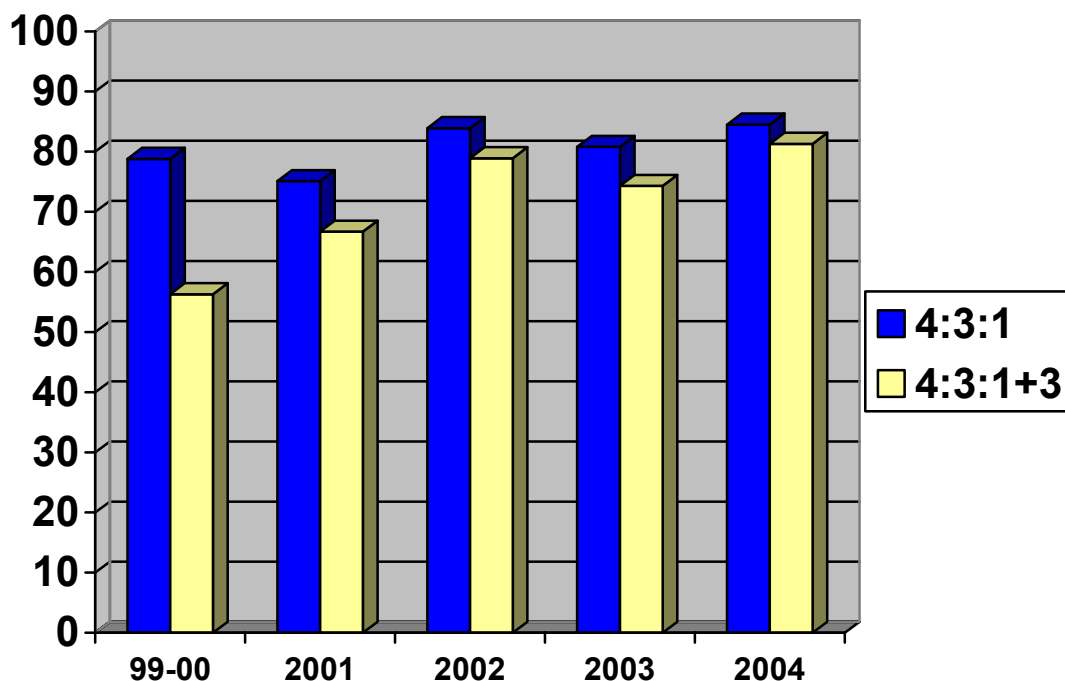


Figure 3 reveals the statewide 4:3:1 coverage rates for the 1999-00, 2001, 2002, 2003 and 2004 studies. The figure also shows statewide 4:3:1+3 vaccination coverage for the 1999-00, 2001, 2002, 2003 and 2004 studies.

The 3:3:1 immunization coverage rates allow for three DTP/DTaP instead of four DTP/DTaP. The number of OPV/IPV and MMR vaccinations remain the same. Table 7 indicates the 3:3:1 immunization coverage rate for the state decreased slightly during the 1999-00 and 2001 studies (82.0 and 78.9 respectively), but increased again in 2002 to 88.8 percent and again in 2004 to 88.5 percent.

Table 7:
3:3:1 State Immunization Coverage by Study Year

Status	Adequately Immunized		Inadequately Immunized	
	Number	Percent	Number	Percent
1999-00	2,290	82.0	503	18.0
2001	2,175	78.9	580	21.1
2002	2,417	88.8	304	11.2
2003	2,205	85.9	362	14.2
2004	2,340	88.5	305	11.5

Note: State rates based on data weighted by health district.

The statewide immunization status for each individual vaccine series is located in Table 8. This table illustrates the number and percent of children who were adequately immunized with each of the recommended vaccines. Vaccines which are part of the 4:3:1+3 shot series are shown here. In 1999-00 and 2001 none of the immunization rates met the state goal of 90 percent coverage; however, during the 2002 assessment nearly all vaccines were at or above the state goal of 90 percent coverage. In 2003, coverage rates decreased slightly, but still showed over 90 percent coverage for 3 DTP/DTaP vaccine series. In 2004, all but one of the vaccine series met the coverage rate of 90 percent. The coverage rate for the Varicella vaccine dramatically increased from 64.3 percent in 1999-00, to 77.9 percent in 2001 and 88.5 percent in 2002. The coverage rate for the Varicella vaccine decreased slightly in 2003 to 81.8 percent, but the rate increased and met the goal of 90 percent in 2004. (Note: The Hib vaccine status can be considered adequate with three or four shots, depending on the manufacturer of the vaccine. For this study, adequate immunization status for the Hib vaccines was calculated considering three Hib shots as "adequate").

Table 8:
State Immunization Status by Vaccine Series by Study Year*

Vaccine	1999-00		2001		2002		2003		2004	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
3 DTP/DTaP	2,491	89.2	2,392	86.8	2,561	94.1	2,340	91.2	2,459	93.0
4 DTP/DTaP	2,233	79.9	2,093	76.0	2,303	84.6	2,096	81.7	2,268	85.7
3 OPV/IPV	2,358	84.4	2,226	80.8	2,466	90.6	2,251	87.7	2,401	90.8
1 MMR	2,363	84.6	2,258	82.0	2,474	90.9	2,266	88.3	2,405	90.9
3 Hib	2,441	87.4	2,322	84.3	2,474	90.9	2,242	87.3	2,387	90.2
3 Hep B	2,422	86.7	2,308	83.8	2,471	90.8	2,255	87.8	2,400	90.7
1 Varicella	1,795	64.3	2,147	77.9	2,407	88.5	2,101	81.8	2,378	89.9
3 PCV	---	---	---	---	---	---	---	---	1,262	47.7
4 PCV	---	---	---	---	---	---	---	---	485	18.3

Note: State rates based on data weighted by health district.

* PCV data not collected before 2004.

In addition to looking at the immunization status of the children in the sample at two years of age, the study also reviewed data on the immunization status of the children at one year of age. Table 9 provides an overview of the immunization status of the children in the final sample of the 1999-00, 2001, 2002, 2003 and 2004 studies at one year of age, looking at coverage status by individual doses of vaccine.

Table 9:
Statewide Immunization Status by
Individual Vaccines at 12 Months of Age

Vaccine	Number 99-00	Percent 99-00	Number 2001	Percent* 2001	Number 2002	Percent* 2002	Number 2003	Percent* 2003	Number 2004	Percent* 2004
DTP/DTaP1	2,588	92.7%	2,507	91.0%	2,667	98.0%	2,447	95.3%	2,554	96.6%
DTP/DTaP2	2,507	89.8%	2,426	88.1%	2,592	95.3%	2,367	92.2%	2,472	93.5%
DTP/DTaP3	2,327	83.3%	2,214	80.4%	2,394	88.0%	2,176	84.8%	2,255	85.3%
DTP/DTaP4	25	0.9%	12	0.4%	23	0.8%	8	0.3%	26	1.0%
DTP/DTaP5	1	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
OPV/IPV1	2,586	92.6%	2,504	90.9%	2,662	97.8%	2,442	95.1%	2,553	96.5%
OPV/IPV2	2,493	89.3%	2,412	87.5%	2,581	94.9%	2,350	91.5%	2,458	92.9%
OPV/IPV3	742	26.6%	601	21.8%	948	34.8%	1,004	39.1%	1,132	42.8%
OPV/IPV4	7	0.3%	1	0.0%	2	0.1%	3	0.1%	5	0.2%
MMR1**	117	4.2%	87	3.2%	34	1.2%	92	3.6%	110	4.2%
MMR2	1	0.0%	0	0.0%	1	0.0%	1	0.0%	0	0.0%
HIB1	2,569	92.0%	2,492	90.5%	2,651	97.4%	2,436	94.9%	2,541	96.1%
HIB2	2,482	88.9%	2,398	87.0%	2,569	94.4%	2,345	91.4%	2,446	92.5%
HIB3	2,220	79.5%	1,720	62.4%	1,267	46.6%	1,110	43.2%	1,063	40.2%
HIB4	61	2.2%	27	1.0%	15	0.6%	16	0.6%	25	0.9%
HIB5	1	0.0%	1	0.0%	0	0.0%	0	0.0%	0	0.0%
HEPB1	2,616	93.7%	2,508	91.0%	2,649	97.4%	2,440	95.1%	2,551	96.4%
HEPB2	2,527	90.5%	2,449	88.9%	2,542	93.4%	2,346	91.4%	2,478	93.7%
HEPB3	2,087	74.7%	1,803	65.4%	1,116	41.0%	1,264	49.2%	1,229	46.5%
HEPB4	23	0.8%	14	0.5%	17	0.6%	19	0.7%	26	1.0%
VAR1**	150	5.4%	118	4.3%	44	1.6%	125	4.9%	136	5.1%
VAR2	0	0.0%	0	0.0%	0	0.0%	1	0.0%	0	0.0%

*Percents are calculated as (number immunized/sample size).

**The Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday.

Sample Size for 1999-00 study = 2,793; 2001 study = 2,755; 2002 study = 2,721; 2003 study = 2,567; 2004 study = 2, 645.

Table 10 shows the 1999-00, 2001, 2002, 2003 and 2004 4:3:1 immunization coverage rates and percents for each of the 19 health districts in the state. *(For more detailed information on immunization rates specific to health districts, see Section IV: Results of District Level Analyses)* The margin of error indicates the confidence limits surrounding the immunization rates. The 2004 margin of error for each health district ranges from +/- 0.0 percent to +/- 10.0 percent. The District level 2004 4:3:1 immunization rates range from 73.1 percent to 100.0 percent. Of the 19 health districts, one had an immunization coverage rate of 100 percent, four had an immunization coverage rate over 90 percent and nine districts had 2003 coverage rates between 80 and 90 percent. The following summary highlights the changes in 4:3:1 coverage rates between 2003 and 2004:

- ❖ Coverage increased between 0 and 5 percent in seven districts (District 1-2, 5-2, 3-4, 6-0, 9-2, 9-3 and 10-0)
- ❖ Coverage increased between 5 and 20 percent in seven districts (Districts 1-1, 2-0, 3-2, 3-5, 7-0, 8-2, and 9-1)
- ❖ Coverage fell between 0 and 5 percent in two districts (Districts 3-1 and 8-1)
- ❖ Coverage fell between 5 and 20 percent in three districts (Districts 3-3, 4-0, and 5-1)

Table 10:
4:3:1 District and State Coverage Rates by Study Year

<u>Dist</u>	1999-00		2001		2002		2003		2004	
	%	Margin of Error	%	Margin of Error	%	Margin of Error	%	Margin of Error	%	Margin of Error
1-1	67.5	+/- 7.1	78.9	+/-6.2	80.6	+/-5.5	77.5	+/-6.7	82.6	+/- 5.0
1-2	75.3	+/-7.0	78.1	+/-6.7	79.1	+/-6.3	85.6	+/-5.6	88.2	+/- 6.3
2-0	88.5	+/-5.5	94.8	+/-3.7	93.4	+/-5.6	94.7	+/-4.5	100	+/- 0
3-1	75.6	+/-6.1	70.7	+/-6.8	84.5	+/-4.2	75.2	+/-7.0	73.1	+/- 6.0
3-2	69.6	+/-6.5	42.4	+/-5.6	82.6	+/-6.2	68.1	+/-7.8	78.3	+/- 5.4
3-3	60.7	+/-10.4	57.6	+/-8.9	73.9	+/-8.2	78.4	+/-4.9	65.1	+/- 10.0
3-4	94.5	+/-2.3	75.9	+/-9.4	94.3	+/-3.4	90.0	+/-7.6	93.5	+/- 3.3
3-5	64.9	+/-6.3	75.5	+/-6.0	84.6	+/-5.1	66.0	+/-7.6	82.0	+/- 4.9
4-0	79.7	+/-5.7	83.5	+/-5.1	87.1	+/-5.4	83.6	+/-6.9	77.5	+/- 6.0
5-1	91.3	+/-6.2	85.0	+/-9.0	80.8	+/-8.7	93.3	+/-5.2	85.5	+/- 9.3
5-2	83.6	+/-9.8	69.1	+/-8.6	84.7	+/-4.5	83.3	+/-6.5	87.1	+/- 6.0
6-0	72.3	+/-12.8	88.9	+/-4.8	89.2	+/-6.0	86.2	+/-6.1	90.5	+/- 5.3
7-0	77.1	+/-6.3	73.1	+/-6.7	82.8	+/-6.9	76.4	+/-7.0	88.4	+/- 4.4
8-1	86.0	+/-6.6	76.7	+/-8.2	82.2	+/-6.6	91.9	+/-4.8	89.5	+/- 6.9
8-2	83.7	+/-5.9	93.2	+/-4.3	83.1	+/-8.4	74.0	+/-7.0	94.9	+/- 3.3
9-1	78.5	+/-7.1	69.1	+/-8.2	80.9	+/-6.2	77.3	+/-6.7	97.5	+/- 3.4
9-2	85.0	+/-6.1	90.8	+/-4.9	85.4	+/-7.3	81.2	+/-6.5	82.2	+/- 6.5
9-3	82.2	+/-8.8	71.6	+/-9.1	85.6	+/-6.3	81.9	+/-7.8	83.1	+/- 8.1
10-0	73.4	+/-7.0	84.4	+/-5.7	80.2	+/-7.1	90.7	+/-4.5	94.3	+/- 4.8
State	78.8	+/-1.5	75.1	+/-1.5	83.9	+/-1.6	80.8	+/-1.6	85.1	+/-1.6

Note: State rates based on data weighted by health district.

Additional information regarding 3:3:1 and 4:3:1+3 coverage rates and margins of error by district can be found in Appendix F: Margins of Error for Immunization Coverage Rates.

Tables 11-16 present the state and district rates for each individual vaccine during the 1999-00, 2001, 2003 and 2004 data collection periods.

As shown in Table 11, 2004 district immunization rates for the DTP/DTaP vaccines ranged from 67.4 percent to 100.0 percent, with a statewide rate of 85.7 percent receiving all four doses. The 2004 statewide DTP/DTaP rate increased from the 2003 study year.

Table 11:
State and District Immunization Rates
for DTP/DTaP by Study Year

District	1999-00 Rates 4 DTP/DTaP	2001 Rates 4 DTP/DTaP	2002 Rates 4 DTP/DTaP	2003 Rates 4 DTP/DTaP	2004 Rates 4 DTP/DTaP
1-1	67.5%	79.5%	81.1%	77.1%	85.3%
1-2	77.4%	79.5%	82.3%	86.3%	88.2%
2-0	89.3%	94.8%	94.7%	95.7%	100%
3-1	77.7%	70.7%	84.9%	76.6%	78.8%
3-2	71.1%	42.4%	84.0%	68.1%	78.8%
3-3	63.1%	61.0%	73.9%	79.1%	67.4%
3-4	94.8%	75.9%	94.9%	90.0%	94.1%
3-5	66.2%	77.0%	84.6%	66.0%	82.4%
4-0	79.7%	83.5%	87.8%	84.5%	79.1%
5-1	91.3%	86.7%	80.8%	93.3%	85.5%
5-2	83.6%	72.7%	85.5%	84.9%	87.1%
6-0	74.5%	89.5%	89.2%	87.8%	90.5%
7-0	77.1%	74.3%	83.6%	77.1%	88.4%
8-1	86.9%	77.7%	82.2%	91.9%	89.5%
8-2	85.6%	94.7%	85.7%	75.3%	94.9%
9-1	80.8%	69.9%	81.6%	77.3%	97.5%
9-2	88.0%	92.4%	86.5%	82.6%	83.0%
9-3	82.2%	71.6%	85.6%	83.0%	83.1%
10-0	74.7%	85.1%	80.2%	93.2%	94.3%
State	79.9%	76.0%	84.6%	81.7%	85.7%

Note: State rates based on data weighted by health district.

Table 12 shows the 1999-00, 2001, 2003 and 2004 state and district rates for the OPV/IPV vaccines. The 2004 district coverage rates for these vaccines varied between 74.4 percent and 100.0 percent. The 2004 statewide immunization rate for OPV/IPV was 90.8 percent, which is slightly higher than the previous year's study rate.

Table 12:
State and District Immunization Rates
for OPV/IPV by Study Year

District	1999-00 Rates 3 OPV/IPV	2001 Rates 3 OPV/IPV	2002 Rates 3 OPV/IPV	2003 Rates 3 OPV/IPV	2004 Rates 3 OPV/IPV
1-1	92.3%	88.6%	90.0%	84.8%	89.9%
1-2	82.2%	86.3%	85.4%	88.9%	92.2%
2-0	88.5%	97.0%	97.4%	94.7%	100%
3-1	79.3%	75.3%	90.8%	83.4%	83.5%
3-2	76.8%	45.5%	84.7%	71.7%	85.0%
3-3	71.4%	69.5%	82.9%	85.8%	74.4%
3-4	96.4%	77.2%	96.0%	90.0%	96.1%
3-5	75.7%	83.7%	88.7%	82.0%	89.5%
4-0	85.9%	86.4%	92.5%	92.7%	85.6%
5-1	93.8%	93.3%	96.2%	97.8%	92.7%
5-2	87.3%	81.8%	94.0%	93.7%	93.2%
6-0	85.1%	93.2%	95.1%	91.9%	94.8%
7-0	85.9%	78.4%	90.5%	85.0%	93.5%
8-1	87.9%	84.5%	95.1%	96.0%	96.1%
8-2	90.8%	96.2%	90.9%	80.7%	97.7%
9-1	88.5%	79.7%	90.1%	88.7%	98.8%
9-2	90.2%	92.4%	92.1%	88.4%	90.4%
9-3	86.3%	76.8%	89.8%	89.4%	88.0%
10-0	76.0%	88.3%	86.0%	93.2%	98.9%
State	84.4%	80.8%	90.6%	87.7%	90.8%

Note: State rates based on data weighted by health district.

Table 13 shows the 1999-00, 2001, 2003 and 2004 state and district rates for MMR. The 2004 district rates for MMR ranged from a low of 75.6 percent to a high of 100.0 percent, with a statewide rate of 90.9 percent coverage. This statewide rate for the MMR vaccine increased from the 2003 rate of 88.3 percent.

Table 13:
State and District Immunization
Rates for MMR by Study Year

District	1999-00 Rates 1 MMR	2001 Rates 1 MMR	2002 Rates 1 MMR	2003 Rates 1 MMR	2004 Rates 1 MMR
1-1	73.5%	89.2%	90.5%	88.1%	91.3%
1-2	83.6%	85.6%	87.3%	90.8%	94.1%
2-0	90.1%	97.0%	96.1%	96.8%	100%
3-1	81.9%	77.0%	90.1%	80.7%	86.3%
3-2	77.8%	45.1%	84.7%	71.0%	82.7%
3-3	70.2%	74.6%	84.7%	85.1%	75.6%
3-4	96.4%	83.5%	97.1%	90.0%	96.1%
3-5	71.6%	87.8%	86.7%	80.7%	90.8%
4-0	84.9%	86.4%	93.2%	92.7%	85.0%
5-1	96.3%	91.7%	97.4%	97.8%	90.9%
5-2	90.9%	82.7%	92.3%	96.8%	93.2%
6-0	87.2%	95.1%	96.1%	91.9%	95.7%
7-0	85.3%	80.2%	92.2%	87.9%	93.0%
8-1	90.7%	82.5%	93.8%	95.2%	92.1%
8-2	88.9%	97.0%	90.9%	81.3%	97.7%
9-1	85.4%	79.7%	89.5%	90.0%	98.8%
9-2	91.0%	93.1%	94.4%	90.6%	89.6%
9-3	87.7%	80.0%	87.3%	89.4%	89.2%
10-0	77.3%	89.6%	90.1%	93.8%	97.7%
State	84.6%	82.0%	90.9%	88.3%	90.9%

Note: State rates based on data weighted by health district.

As shown in Table 14, 2004 district immunization rates for the Hib vaccine varied between 76.7 and 100.0 percent. The statewide Hib coverage rate in 2004 was 90.2 percent, an increase from the 2003 statewide rate of 87.3 percent.

Table 14:
State and District Immunization
Rates for Hib by Study Year

District	1999-00 Rates 3 Hib	2001 Rates 3 Hib	2002 Rates 3 Hib	2003 Rates 3 Hib	2004 Rates 3 Hib
1-1	76.5%	89.2%	91.5%	84.1%	90.8%
1-2	86.3%	95.2%	86.1%	90.8%	94.1%
2-0	88.5%	96.3%	96.1%	93.6%	100%
3-1	85.0%	83.9%	91.2%	82.1%	82.1%
3-2	79.9%	45.5%	85.4%	72.5%	84.1%
3-3	79.8%	81.4%	80.2%	88.4%	76.7%
3-4	97.5%	92.4%	96.6%	90.0%	96.7%
3-5	77.0%	89.3%	86.2%	76.0%	88.3%
4-0	88.5%	88.3%	93.2%	87.3%	86.6%
5-1	96.3%	91.7%	97.4%	97.8%	87.3%
5-2	96.4%	84.5%	92.7%	91.3%	91.2%
6-0	87.2%	97.5%	97.1%	93.5%	92.2%
7-0	85.3%	82.6%	89.7%	85.7%	93.0%
8-1	92.5%	81.6%	94.6%	95.2%	94.7%
8-2	92.8%	92.5%	92.2%	81.3%	98.3%
9-1	91.5%	81.3%	90.8%	87.3%	98.8%
9-2	95.5%	95.4%	93.3%	86.2%	91.1%
9-3	89.0%	81.1%	91.5%	89.4%	84.3%
10-0	79.9%	94.2%	86.8%	95.7%	95.5%
State	87.4%	84.3%	90.9%	87.3%	90.2%

Note: State rates based on data weighted by health district.

Table 15 reports the statewide and district immunization coverage rates for the Hepatitis B vaccine. In 2004, the district coverage rates varied from a low of 77.9 percent to 100.0 percent. The 2004 statewide rate of 90.7 percent for the Hepatitis B vaccine was higher than the 2003 statewide rate of 87.8 percent.

Table 15:
State and District Immunization Rates
for Hep B by Study Year

District	1999-00 Rates 3 Hep B	2001 Rates 3 Hep B	2002 Rates 3 Hep B	2003 Rates 3 Hep B	2004 Rates 3 Hep B
1-1	76.5%	92.8%	91.0%	83.4%	90.8%
1-2	86.3%	93.2%	87.3%	90.8%	94.1%
2-0	89.3%	95.6%	97.4%	93.6%	98.5%
3-1	85.5%	82.8%	92.6%	86.2%	83.0%
3-2	79.4%	44.4%	84.7%	74.6%	85.4%
3-3	76.2%	81.4%	80.2%	88.8%	77.9%
3-4	97.5%	86.1%	94.9%	90.0%	96.7%
3-5	77.9%	88.8%	85.6%	78.0%	89.1%
4-0	85.9%	88.8%	92.5%	92.7%	86.1%
5-1	96.3%	93.3%	96.2%	96.7%	90.9%
5-2	89.1%	83.6%	93.1%	93.7%	91.8%
6-0	85.1%	93.2%	96.1%	95.1%	94.0%
7-0	87.6%	85.0%	90.5%	87.9%	93.5%
8-1	92.5%	84.5%	94.6%	96.0%	96.1%
8-2	90.2%	95.5%	92.2%	82.0%	97.7%
9-1	89.2%	76.4%	90.1%	79.3%	100%
9-2	91.7%	95.4%	92.1%	87.7%	90.4%
9-3	87.7%	81.1%	89.0%	86.2%	86.7%
10-0	79.9%	91.6%	88.4%	95.1%	94.3%
State	86.7%	83.8%	90.8%	87.8%	90.7%

Note: State rates based on data weighted by health district.

Table 16 reports Varicella coverage rates among the 19 health districts and statewide by study year. Children reported to have had Varicella disease are not considered in the results below. For a more detailed description of Varicella rates including prior history of disease, see Appendix D. The district coverage rates ranged from 74.4 percent to 98.8 percent, with a statewide coverage rate of 89.9 percent for the Varicella vaccine. This is an increase from the 2003 Varicella rate of 86.7 percent.

Table 16:
State and District Immunization
Rates for Varicella by Study Year

District	1999-00 Rates 1 Varicella	2001 Rates 1 Varicella	2002 Rates 1 Varicella	2003 Rates 1 Varicella	2004 Rates 1 Varicella
1-1	45.2%	83.7%	89.1%	86.8%	89.0%
1-2	58.2%	82.9%	86.1%	90.2%	95.1%
2-0	81.7%	94.8%	96.1%	96.8%	98.5%
3-1	66.3%	72.4%	88.4%	80.7%	83.5%
3-2	67.5%	44.4%	81.9%	71.7%	81.4%
3-3	52.4%	69.5%	82.9%	84.7%	74.4%
3-4	89.5%	86.1%	96.0%	90.0%	94.1%
3-5	57.2%	81.1%	83.6%	74.0%	89.5%
4-0	65.6%	83.0%	92.5%	92.7%	85.0%
5-1	61.3%	86.7%	84.6%	95.6%	90.9%
5-2	61.8%	80.0%	90.3%	92.9%	91.2%
6-0	61.7%	88.3%	97.1%	90.2%	94.8%
7-0	53.5%	74.9%	88.8%	85.7%	93.5%
8-1	61.7%	78.6%	93.0%	94.4%	92.1%
8-2	66.0%	96.2%	90.9%	78.0%	97.7%
9-1	51.5%	71.5%	83.6%	83.3%	98.8%
9-2	58.6%	88.5%	87.6%	91.3%	90.4%
9-3	57.5%	69.5%	83.9%	86.2%	88.0%
10-0	58.4%	87.0%	86.8%	95.7%	94.3%
State	64.3%	77.9%	88.5%	86.7%	89.9%

Notes: State rates based on data weighted by health district.

Statewide Comparisons of Maternal Demographics of Adequately Immunized Children

Cross-tabulations were performed at the state level in order to describe the relationship between maternal characteristics and the immunization status of two-year-old children. Tables 17-19 provide some of the characteristics of mothers of children who were up-to-date on their 4:3:1 series. Analyses include cross-tabulations of 4:3:1 complete children and total children in each group with the following three variables: maternal race, maternal education, and maternal Medicaid status. Differences between groups are significant if the p-value is less than 0.05.

Table 17 contains statewide cross-tabulations of maternal race and children's immunization status. The numbers in the top row of each cell represent the total number of individuals who fall into each category by race and adequacy of immunization. The bottom row represents the percent of each race that falls into that specific category. The table shows that for the 2001 and 2002 study years the immunization rates of children born to black and white mothers were virtually the same. However, in the 2003 and 2004 study years maternal race was a significant factor in the immunization status of two-year-old children in Georgia.

Table 17:
Statewide Cross tabulations of
Maternal Race and Child Immunization Status by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	1265/1661 (76.2)	1410/1664 (84.7)	1221/1560 (78.3)	1377/1587 (86.8)
Black	765/1045 (73.2)	806/978 (82.4)	661/940 (70.3)	800/977 (81.9)
Other	38/49 (77.6)	64/79 (81.0)	53/67 (79.1)	75/81 (92.6)
4:3:1 Total	75.1%	83.9%	80.8%	85.1%

Notes: Total rates based on data weighted by health district.
2001 Chi-square=3.15, p=0.21; 2002 Chi-square=3.81, p=0.28; 2003 Chi-square=20.49, p<.05; 2004 Chi-square=15.07, p<.05.

Table 18 shows the statewide cross-tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group according to the immunization status of their children. The bottom row represents the percent of the total number in that category. In 2002, 2003, and 2004 maternal educational attainment was associated with child immunization status. As the mother's education level increased, the child's immunization rate increased as well.

Table 18:
Statewide Cross tabulations of Maternal Educational Attainment
and Child Immunization Status by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Education	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	161/221 (72.9)	124/157 (79.0)	25/33 (75.8)	28/32 (87.5)
Some high school	456/595 (76.6)	455/561 (81.1)	297/408 (72.8)	360/428 (84.1)
High school	724/960 (75.4)	752/914 (82.3)	619/856 (72.1)	687/816 (84.2)
Some college	364/485 (75.1)	415/498 (83.3)	380/495 (76.8)	438/523 (83.7)
College or higher	363/494 (73.5)	538/591 (91.0)	614/775 (79.2)	739/846 (87.4)
4:3:1 Total	75.1%	83.9%	80.8%	85.1%

Notes: Total rates based on data weighted by health district. 2001 Chi-square=2.09, p=0.7; 2002 Chi-square=31.97, p<0.05; 2003 Chi-square=12.50, p<0.05; 2004 Chi-square=5.15, p=0.27.

Table 19 shows the statewide cross-tabulation of maternal Medicaid status and 4:3:1 immunization status for 2002, 2003 and 2004 study years. The 4:3:1 rates are shown for Medicaid recipients and non-Medicaid recipients. During the 2002, 2003, and 2004 study years, statewide immunization rates were significantly higher for Non-Medicaid recipients (Chi-square=15.34, p=0.00009 and Chi-square=17.45, p < .05, respectively).

Table 19:
2004 Statewide Cross tabulations
of Maternal Medicaid Status and Child Immunization Status

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	1,054/1,300 (81.1)	991/1,375 (72.1)	1,203/1,440 (83.5)
Non-Medicaid	1,230/1,421 (86.6)	944/1,192 (79.2)	1,049/1,205 (87.1)
4:3:1 Total	83.9%	80.8%	85.1%

Notes: 4:3:1 total rates based on data weighted by health district. 2002 Chi-square = 15.13, p<0.05; 2003 Chi-square = 17.45, p <.05; 2004 Chi-square = 6.40, p <.05.

Summary of Statewide Analyses

The statewide analyses reviewed both the study's process of measuring immunization rates and the rates themselves. In measuring immunization rates, the study assessed rates at three levels: 4:3:1+3 coverage, 4:3:1 coverage, and 3:3:1 coverage.

In reviewing rates at the most commonly used level of coverage, 4:3:1 coverage, immunization rates increased in 2004 statewide compared to the same rates as measured by this study in 2003.

SECTION IV:
RESULTS OF DISTRICT LEVEL
ANALYSES

Section IV: Results of District Level Analyses

Overview of District Rates

The immunization rates for this fifth year report were calculated based on final samples. The final sample sizes in each health district varied by district. The number of children in the final sample in each district is reported in each Individual Health District Report in this section, as well as in Table 3: Response Rates for the 2004 Georgia Immunization Study. The rates reported are based on information collected from both public and private providers. Summaries of all district rates are included in Section III: Statewide Rates, specifically Tables 10-16. The Individual District Reports include immunization rates for each recommended vaccine and 4:3:1 rates. Although statistical analyses would be informative for each of the districts, sub-category sample sizes in the cross tabulation tables were too small for such analyses to be interpreted and generalized to the target population.

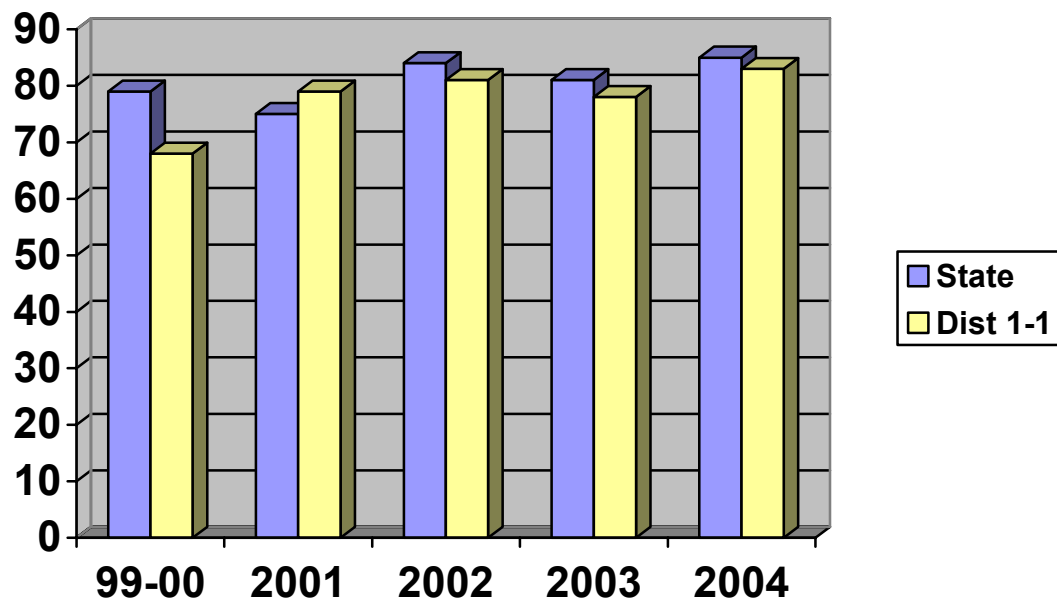
Individual Health District Report: District 1-1

The eligible sample from this district included 233 children born in January 2002. From the 233 children, 222 records were located (Response Rate=95.2%). Of the 222 located records, there were 4 parental refusals leaving a final sample of 218 records.

- ❖ **The 4:3:1 immunization coverage estimate is 82.6 percent (180/218).**

This rate is lower than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 4: 4:3:1 Coverage for State and District 1-1



- ❖ **The 4:3:1+3 immunization coverage estimate is 79.4 percent (173/218).**

This rate is lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 20:
District Immunization Rates for
Health District 1-1 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	67.5%	79.5%	81.1%	77.5%	85.3%
3 OPV/IPV	82.2%	88.6%	90.0%	84.8%	89.9%
1 MMR	73.5%	89.2%	90.5%	88.1%	91.3%
3 Hib	76.5%	89.2%	91.5%	84.1%	90.8%
3 HepB	76.5%	92.8%	91.0%	83.4%	90.8%
1 Varicella	45.2%	83.7%	89.1%	86.8%	89.0%
3 PCV	---	---	---	---	51.4%
4 PCV	---	---	---	---	15.6%

*PCV data not collected before 2004.

Table 20 reveals the coverage rates of each vaccine series. Coverage rates ranged from 15.6 to 91.3 percent for the 2004 study data.

Table 21 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 21:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 1-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	211	96.3%
DTP2/DTaP2	204	93.6%
DTP3/DTaP3	187	85.8%
DTP4/DTaP4	2	0.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	211	96.8%
OPV/IPV2	202	92.7%
OPV/IPV3	82	37.6%
OPV/IPV4	1	0.5%
MMR1	13	6.0%
MMR2	0	0.0%
HIB1	210	96.3%
HIB2	203	93.1%
HIB3	81	37.2%
HIB4	2	0.9%
HIB5	0	0.0%
HEPB1	209	95.9%
HEPB2	204	93.6%
HEPB3	87	39.9%
HEPB4	0	0.0%
VAR1	12	5.5%
VAR2	0	0.0%

*Percent = number immunized / sample size
sample size = 218

Table 22:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 1-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1: Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	123/154 (79.9)	140/174 (80.5)	96/135 (71.1)	154/185 (83.2)
Black	8/12 (66.7)	19/23 (82.6)	9/16 (56.3)	21/27 (77.8)
Other	----	3/3 (100.0)	----	5/6 (83.3)
Total	131/166 (78.9)	162/200 (81.0)	105/151 (69.5)	180/218 (82.6)

Table 22 contains a cross tabulation of maternal race and children's immunization status. The numbers in the top row of each cell represent the total number of individuals in each category. The bottom row in each cell represents the percent in that immunization status category.

- ❖ Table 22 shows that in 2002 the 4:3:1 immunization rate of children born to black mothers was higher than that of children born to white mothers in the district. However, in 2001, 2003, and 2004 the immunization rate of children born to white mothers was higher than that of black mothers.

Table 23:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 1-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	14/15 (93.3)	9/14 (64.3)	2/2 (100.0)	3/3 (100.0)
Some high school	29/41 (70.7)	36/50 (72.0)	18/25 (72.0)	22/26 (84.6)
High school graduate	41/52 (78.8)	66/79 (83.5)	25/43 (58.1)	73/89 (82.0)
Some college	27/35 (77.1)	29/35 (82.9)	24/31 (77.4)	35/46 (76.1)
College or more	20/23 (87.0)	19/20 (95.0)	36/50 (72.0)	47/54 (87.0)
Unknown	---	3/3 (100.0)	---	---
Total	131/166 (78.9)	162/200 (81.0)	105/151 (69.5)	180/218 (82.6)

Table 23 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status in District 1-1. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ For the 2004 study, immunization rates varied with educational attainment.

Table 24:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 1-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	79/99 (79.8)	49/78 (62.8)	84/103 (81.6)
Non-Medicaid	83/102 (81.4)	56/73 (76.7)	96/115 (83.5)
Total	162/200 (81.0)	105/151 (69.5)	180/218 (82.6)

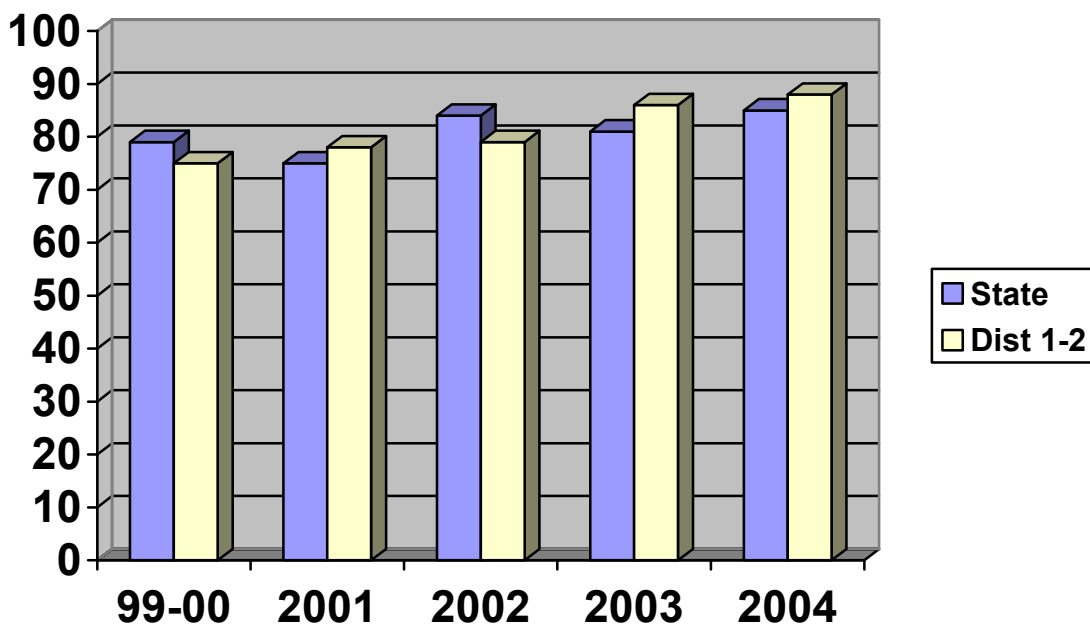
Table 24 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 1-1, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 1-2

The eligible sample from this district included 136 children born in January 2002. From these children, 113 records were located (Response Rate=83.1%). Of the 113 located records, there were 11 parental refusals leaving a final sample of 102 records.

- ❖ **4:3:1 immunization coverage estimate is 88.2 percent (90/102).** This rate is higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 5: 4:3:1 Coverage for State and District 1-2



- ❖ **4:3:1+3 immunization coverage estimate 85.3 percent (87/102).** This rate is higher than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 25:
District Immunization Rates for
Health District 1-2 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	77.4%	79.5%	82.3%	86.3%	88.2%
3 OPV/IPV	82.2%	86.3%	85.4%	88.9%	92.2%
1 MMR	83.6%	85.6%	87.3%	90.8%	94.1%
3 Hib	86.3%	95.2%	86.1%	90.8%	94.1%
3 HepB	86.3%	93.2%	87.3%	90.8%	94.1%
1 Varicella	58.2%	82.9%	86.1%	90.2%	95.1%
3 PCV	---	---	---	---	56.9%
4 PCV	---	---	---	---	14.7%

*PCV data not collected before 2004.

Table 25 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 14.7 to 95.1 percent for the 2004 study data.

Table 26 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 26:
2004 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 1-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	97	95.1%
DTP2/DTaP2	95	93.1%
DTP3/DTaP3	86	84.3%
DTP4/DTaP4	1	1.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	97	95.1%
OPV/IPV2	92	90.2%
OPV/IPV3	50	49.0%
OPV/IPV4	0	0.0%
MMR1	9	8.8%
MMR2	0	0.0%
HIB1	97	95.1%
HIB2	93	91.2%
HIB3	29	28.4%
HIB4	1	1.0%
HIB5	0	0.0%
HEPB1	97	95.1%
HEPB2	95	93.1%
HEPB3	34	33.3%
HEPB4	0	0.0%
VAR1	9	8.8%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 102

Table 27:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 1-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	112/142 (78.9)	118/149 (79.2)	118/145 (81.4)	86/98 (87.8)
Black	2/4 (50.0)	2/3 (66.7)	1/2 (50.0)	3/3 (100.0)
Other	---	2/2 (100.0)	4/6 (66.7)	1/1 (100.0)
Unknown	---	3/4 (75.0)	---	---
Total	114/146 (78.1)	125/158 (79.1)	123/153 (80.4)	90/102 (88.2)

Table 27 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The sample of non-white mothers in the district was too small to make generalizations from these numbers.

Table 28:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 1-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	14/20 (70.0)	10/10 (100.0)	3/3 (100.0)	1/1 (100.0)
Some high school	32/37 (86.5)	28/37 (75.7)	16/22 (72.7)	15/19 (79.0)
High school graduate	30/45 (66.7)	25/36 (69.4)	36/44 (81.8)	28/30 (93.3)
Some college	21/23 (91.3)	31/37 (83.8)	24/30 (80.0)	8/10 (80.0)
College or more	17/21 (81.0)	29/34 (85.3)	44/54 (81.5)	38/42 (90.5)
Unknown	----	2/4 (50.0)	----	---
Total	114/146 (78.1)	125/158 (79.1)	123/153 (80.4)	90/102 (88.2)

Table 28 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Immunization rates varied from year to year in relation to education of the mother.

Table 29:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 1-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	44/60 (73.3)	43/62 (69.4)	43/52 (82.7)
Non-Medicaid	81/98 (82.7)	80/91 (87.9)	47/50 (94.0)
Total	125/158 (79.1)	123/153 (80.4)	90/102 (88.2)

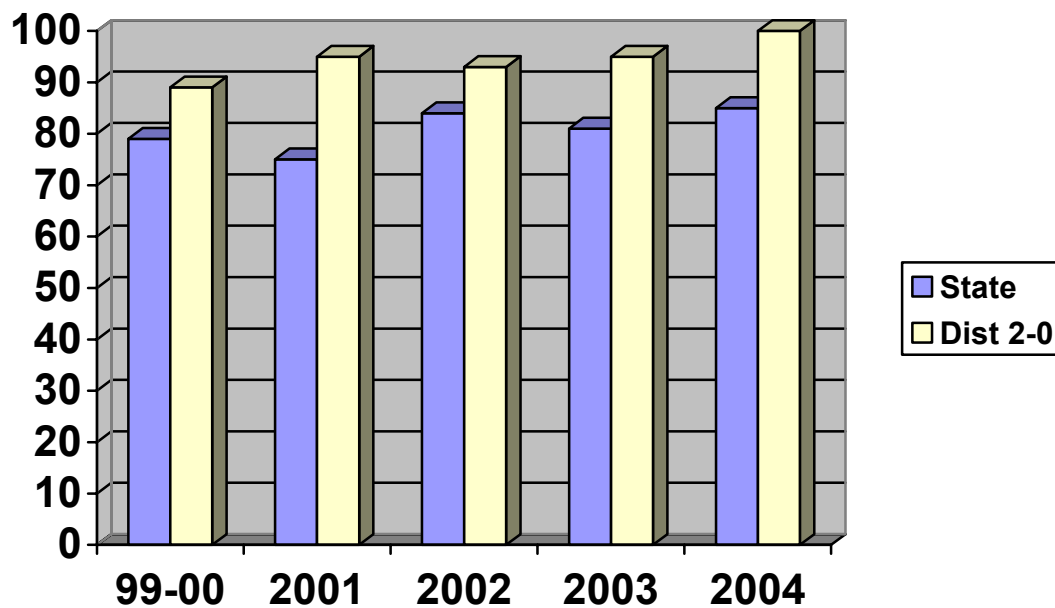
Table 29 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 1-2, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 2-0

The eligible sample from this district included 75 children born in January 2002. From the 75 children, 70 records were located (Response rate = 93.3%). Of the 103 located records, there were 3 parental refusals leaving a final sample of 67 records.

- ❖ **4:3:1 immunization coverage estimate is 100% percent (67/67).** This rate is much higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 6: 4:3:1 Coverage for State and District 2-0



- ❖ **4:3:1+3 immunization coverage estimate is 94 percent (63/67).** This rate is also much higher than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 30:
District Immunization Rates for
Health District 2-0 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	89.3%	94.8%	94.7%	95.7%	100%
3 OPV/IPV	88.5%	97.0%	97.4%	94.7%	100%
1 MMR	90.1%	97.0%	96.1%	96.8%	100%
3 Hib	88.5%	96.3%	96.1%	93.6%	100%
3 HepB	89.3%	95.6%	97.4%	93.6%	100%
1 Varicella	81.7%	94.8%	96.1%	96.8%	98.5%
3 PCV	---	---	---	---	77.6%
4 PCV	---	---	---	---	28.4%

*PCV data not collected before 2004.

Table 30 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 28.4 to 100 percent for the 2004 study data.

Table 31 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 31:
2004 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 2-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	67	100%
DTP2/DTaP2	67	100%
DTP3/DTaP3	65	97.0%
DTP4/DTaP4	67	100%
DTP5/DTaP5	0	0.0%
OPV/IPV1	67	100%
OPV/IPV2	67	100%
OPV/IPV3	34	50.7%
OPV/IPV4	0	0.0%
MMR1	1	1.5%
MMR2	0	0.0%
HIB1	67	100%
HIB2	67	100%
HIB3	35	52.2%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	67	100%
HEPB2	66	98.5%
HEPB3	41	61.2%
HEPB4	0	0.0%
VAR1	1	1.5%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 67

Table 32:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 2-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	121/127 (95.3)	65/70 (92.9)	82/91 (90.1)	65/65 (100.0)
Black	5/6 (83.3)	4/4 (100.0)	3/3 (100.0)	2/2 (100.0)
Other	2/2 (100.0)	2/2 (100.0)	---	---
Total	128/135 (94.8)	71/76 (93.4)	85/94 (90.4)	67/67 (100.0)

Table 32 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 32 shows that the number of white mothers was over 10 times the number of black mothers in each year of the study for District 2-0. The sample size of black mothers was too small to make definitive generalizations on racial differences in immunization rates.

Table 33:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 2-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	23/25 (92.0)	9/9 (100.0)	1/1 (100.0)	---
Some high school	24/24 (100.0)	15/18 (83.3)	11/12 (91.7)	11/11 (100.0)
High school graduate	38/42 (90.5)	20/21 (95.2)	38/41 (92.7)	16/16 (100.0)
Some college	15/16 (93.8)	7/8 (87.5)	5/7 (71.4)	9/9 (100.0)
College or more	28/28 (100.0)	17/17 (100.0)	30/33 (90.9)	31/31 (100.0)
Unknown	---	3/3 (100.0)	---	---
Total	128/135 (94.8)	71/76 (93.4)	85/94 (90.4)	67/67 (100.0)

Table 33 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in District 2-0 was at 100%, with no correlation with educational level.

Table 34:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 2-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	24/28 (85.7)	49/52 (94.2)	29/29 (100.0)
Non-Medicaid	47/48 (97.9)	36/42 (85.7)	38/38 (100.0)
Total	71/76 (93.4)	85/94 (90.4)	67/67 (100.0)

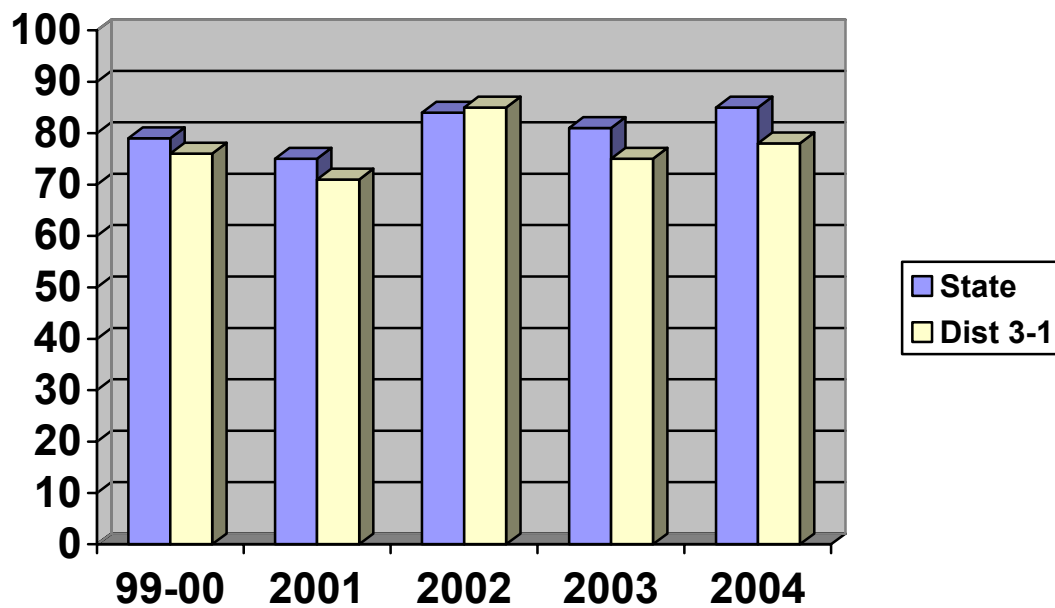
Table 34 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. During the 2002 study year, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid. This trend was reversed during the 2003 study year. However, in 2004 children born to Medicaid women had the same immunization rate as children born to non-Medicaid women.

Individual Health District Report: District 3-1

The eligible sample from this district included 294 children born in January 2002. From the 294 children, 225 records were located (Response Rate=76.5%). Of the 225 located records, there were 13 parental refusals leaving a final sample of 212 records.

- ❖ **The 4:3:1 immunization coverage estimate is 78.3 percent (166/212).**
This rate is lower than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 7: 4:3:1 Coverage for State and District 3-1



- ❖ **The 4:3:1+3 immunization coverage estimate is 73.1 percent (155/212).**
This rate is lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 35:
District Immunization Rates for
Health District 3-1 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	77.7%	70.7%	84.9%	76.6%	78.8%
3 OPV/IPV	79.3%	75.3%	90.8%	83.4%	83.5%
1 MMR	81.9%	77.0%	90.1%	80.7%	86.3%
3 Hib	85.0%	83.9%	91.2%	82.1%	82.1%
3 HepB	85.5%	82.8%	92.6%	86.2%	83.0%
1 Varicella	66.3%	72.4%	88.4%	80.7%	83.5%
3 PCV	---	---	---	---	46.7%
4 PCV	---	---	---	---	23.1%

*PCV data not collected before 2004.

Table 35 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 23.1 to 86.3 percent for the 2004 study data.

Table 36 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 36:
2004 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 3-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	202	95.3%
DTP2/DTaP2	193	91.0%
DTP3/DTaP3	175	82.5%
DTP4/DTaP4	2	0.9%
DTP5/DTaP5	0	0.0%
OPV/IPV1	200	94.3%
OPV/IPV2	190	89.6%
OPV/IPV3	72	34.0%
OPV/IPV4	1	0.0%
MMR1	10	4.7%
MMR2	0	0.0%
HIB1	200	94.3%
HIB2	189	89.2%
HIB3	76	35.8%
HIB4	4	1.9%
HIB5	0	0.0%
HEPB1	201	94.8%
HEPB2	190	89.6%
HEPB3	93	43.9%
HEPB4	1	0.5%
VAR1	12	5.7%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 212

Table 37:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 3-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	95/128 (74.2)	179/207 (86.5)	84/108 (77.8)	118/142 (83.1)
Black	22/40 (55.0)	51/66 (77.3)	21/35 (60.0)	40/60 (66.7)
Other	6/6 (100.0)	8/9 (88.9)	1/2 (50.0)	8/10 (80.0)
Unknown	---	2/2 (100.0)	---	---
Total	123/174 (70.7)	240/284 (84.5)	106/145 (73.1)	166/212 (78.3)

Table 37 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 37 shows that the number of white mothers in the District 3-1 sample was substantially higher than the number of black mothers in each year of the study. The table also shows no clear relationship between race and immunization status in this district.

Table 38:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 3-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	7/16 (43.8)	17/26 (65.4)	3/3 (100.0)	5/8 (62.5)
Some high school	17/23 (73.9)	21/28 (75.0)	7/10 (70.0)	9/11 (81.8)
High school graduate	41/53 (77.4)	60/74 (81.1)	25/38 (65.8)	37/52 (71.2)
Some college	22/34 (64.7)	38/46 (82.6)	14/23 (60.9)	33/46 (71.2)
College or more	36/48 (75.0)	99/105 (94.3)	57/71 (80.3)	82/95 (86.3)
Unknown	---	5/5 (100.0)	---	---
Total	123/174 (70.7)	240/284 (84.5)	106/145 (73.1)	166/212 (78.3)

Table 38 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers.

- ❖ In the 2002 study year, immunization status of children in District 3-1 varied significantly (p-value = 0.002) with maternal educational attainment. Immunization status increased as maternal education increased. The other study years showed no correlation between educational attainment and immunization rate.

Table 39:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 3-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	58/79 (73.4)	21/35 (60.0)	53/71 (74.6)
Non-Medicaid	182/205 (88.8)	85/110 (77.3)	113/141 (80.1)
Total	240/284 (84.5)	106/145 (73.1)	166/212 (78.3)

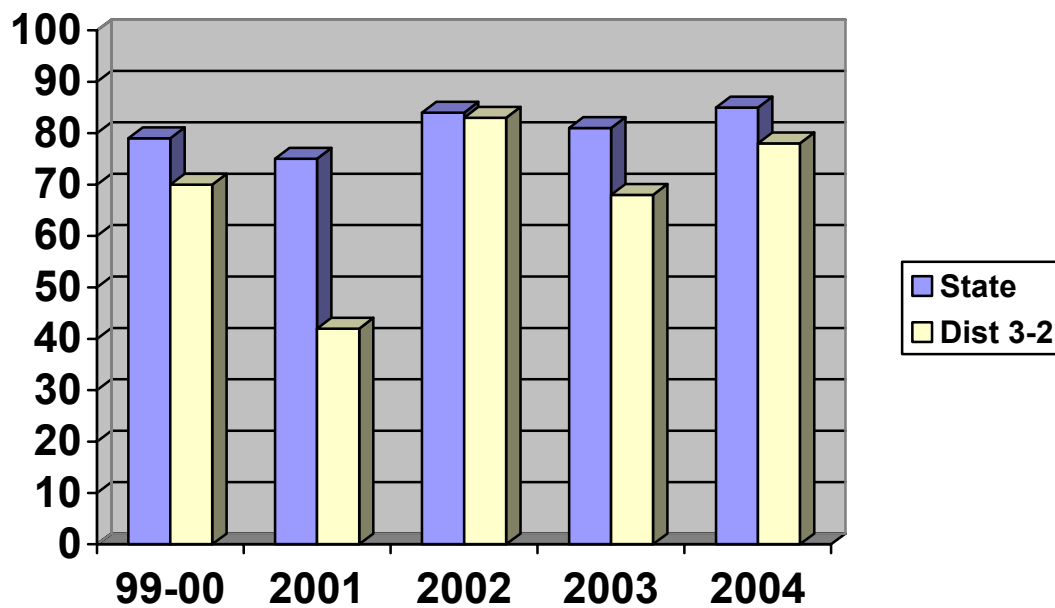
Table 39 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 3-1, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-2

The eligible sample from this district included 631 children born in January 2002. From the 631 children, 244 records were located (Response Rate=38.9%). Of the 244 located records, there were 18 parental refusals leaving a final sample of 226 records.

- ❖ **The 4:3:1 immunization coverage estimate is 78.3 percent (177/226).**
This rate is lower than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 8: 4:3:1 Coverage for State and District 3-2



- ❖ **The 4:3:1+3 immunization coverage estimate is 75.2 percent (170/226).**
This rate is also lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 40:
District Immunization Rates for
Health District 3-2 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	71.1%	42.4%	84.0%	68.1%	78.8%
3 OPV/IPV	76.8%	45.5%	84.7%	71.7%	85.0%
1 MMR	77.8%	45.1%	84.7%	71.0%	82.7%
3 Hib	79.9%	45.5%	85.4%	72.5%	84.1%
3 HepB	79.4%	44.4%	84.7%	74.6%	85.4%
1 Varicella	67.5%	44.4%	81.9%	71.7%	81.4%
3 PCV	---	---	---	---	66.8%
4 PCV	---	---	---	---	35.8%

*PCV data not collected before 2004.

Table 40 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 35.8 to 85.4 percent for the 2004 study data.

Table 41 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 41:
2004 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 3-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	201	88.9%
DTP2/DTaP2	190	84.1%
DTP3/DTaP3	171	75.7%
DTP4/DTaP4	3	1.3%
DTP5/DTaP5	0	0.0%
OPV/IPV1	201	88.9%
OPV/IPV2	191	84.5%
OPV/IPV3	102	45.1%
OPV/IPV4	0	0.0%
MMR1	10	4/4%
MMR2	0	0.0%
HIB1	199	88.1%
HIB2	187	82.7%
HIB3	95	42.0%
HIB4	3	1.3%
HIB5	0	0.0%
HEPB1	202	89.4%
HEPB2	194	85.8%
HEPB3	101	44.7%
HEPB4	0	0.0%
VAR1	13	5.8%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 226

Table 42:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 3-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	66/148 (44.6)	69/79 (87.3)	50/76 (65.8)	95/113 (84.1)
Black	58/143 (40.6)	48/61 (78.7)	31/59 (52.5)	69/99 (69.7)
Other	2/6 (33.3)	2/3 (66.7)	3/3 (100.0)	13/14 (92.9)
Total	126/297 (42.4)	119/144 (82.6)	84/138 (60.9)	177/226 (78.3)

Table 42 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ In all years of the study, the immunization rate of children born to white mothers was higher than that of black mothers.

Table 43:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 3-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	16/30 (53.3)	7/9 (77.8)	3/3 (100.0)	3/3 (100.0)
Some high school	24/47 (51.1)	15/20 (75.0)	7/14 (50.0)	25/34 (73.5)
High school graduate	25/69 (36.2)	20/26 (76.9)	16/27 (59.3)	36/47 (76.6)
Some college	15/37 (40.5)	22/28 (78.6)	7/21 (33.3)	17/24 (70.8)
College or more	46/114 (40.4)	50/55 (90.9)	51/73 (69.9)	96/118 (81.3)
Unknown	---	5/6 (83.3)	---	---
Total	126/297 (42.4)	119/144 (82.6)	84/138 (60.9)	177/226 (78.3)

Table 43 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in the sample in District 3-2 varied with maternal educational attainment.

Table 44:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 3-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	37/48 (77.1)	32/67 (47.8)	74/103 (71.8)
Non-Medicaid	82/96 (85.4)	52/71 (73.2)	103/123 (83.7)
Total	119/144 (82.6)	84/138 (60.9)	177/226 (78.3)

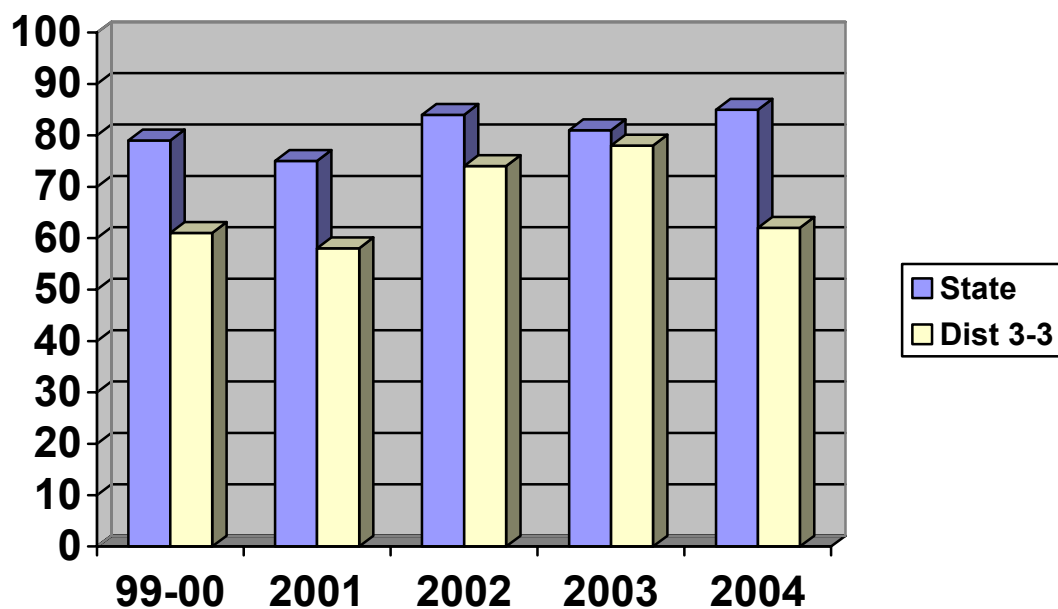
Table 44 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 3-2, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-3

The eligible sample from this district included 218 children born in January 2002. From the 218 children, 86 records were located (Response Rate=39.4%). Of the 86 located records, there were 0 parental refusals leaving a final sample of 86 records.

- ❖ **The 4:3:1 immunization coverage estimate is 65.1 percent (56/86).** This rate is much lower than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 9: 4:3:1 Coverage for State and District 3-3



- ❖ **The 4:3:1+3 immunization coverage estimate is 62.8 percent (54/86).** This rate is much lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 45:
District Immunization Rates for
Health District 3-3 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	63.1%	61.0%	73.9%	79.1%	67.4%
3 OPV/IPV	71.4%	69.5%	82.9%	85.8%	74.4%
1 MMR	70.2%	74.6%	84.7%	85.1%	75.6%
3 Hib	79.8%	81.4%	80.2%	88.4%	76.7%
3 HepB	76.2%	81.4%	80.2%	88.8%	77.9%
1 Varicella	52.4%	69.5%	82.9%	84.7%	74.4%
3 PCV	---	---	---	---	30.2%
4 PCV	---	---	---	---	11.6%

*PCV data not collected before 2004.

Table 45 reveals the coverage rates of each vaccine series. Coverage rates ranged from 11.6 to 77.9 percent.

Table 46 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 46:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	81	94.2%
DTP2/DTaP2	76	88.4%
DTP3/DTaP3	64	74.4%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	80	93.0%
OPV/IPV2	75	87.2%
OPV/IPV3	33	38.4%
OPV/IPV4	0	0.0%
MMR1	1	1.2%
MMR2	0	0.0%
HIB1	79	91.9%
HIB2	76	88.4%
HIB3	46	53.5%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	80	93.0%
HEPB2	78	90.7%
HEPB3	50	58.1%
HEPB4	1	1.2%
VAR1	5	5.8%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 86

Table 47:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 3-3 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	27/49 (55.1)	40/52 (76.9)	75/104 (72.1)	22/35 (62.9)
Black	39/67 (58.2)	38/54 (70.4)	103/142 (72.5)	31/47 (66.0)
Other	2/2 (100.0)	3/4 (75.0)	20/23 (87.0)	3/4 (75.0)
Unknown	---	1/1 (100.0)	---	---
Total	68/118 (57.6)	82/111 (73.9)	198/269 (73.6)	56/86 (65.1)

Table 47 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in the sample in District 3-3 varied with maternal race.

Table 48:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 3-3 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	1/4 (25.0)	12/13 (92.3)	4/6 (66.7)	---
Some high school	17/31 (54.8)	10/18 (55.6)	28/40 (70.0)	4/6 (66.7)
High school graduate	31/48 (64.6)	25/36 (69.4)	57/85 (67.1)	18/30 (60.0)
Some college	15/26 (57.7)	17/21 (81.0)	52/62 (83.9)	13/23 (56.5)
College or more	4/9 (44.4)	16/20 (80.0)	57/76 (75.0)	21/27 (77.8)
Unknown	---	2/3 (66.7)	---	---
Total	68/118 (57.6)	82/111 (73.8)	198/269 (73.6)	56/86 (65.1)

Table 48 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in the sample in District 3-3 does not appear to change with educational attainment.

Table 49:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 3-3

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	41/58 (70.7)	92/127 (72.4)	31/54 (57.4)
Non-Medicaid	41/53 (77.4)	106/142 (74.6)	25/32 (78.1)
Total	82/111 (73.9)	198/269 (73.6)	56/86 (65.1)

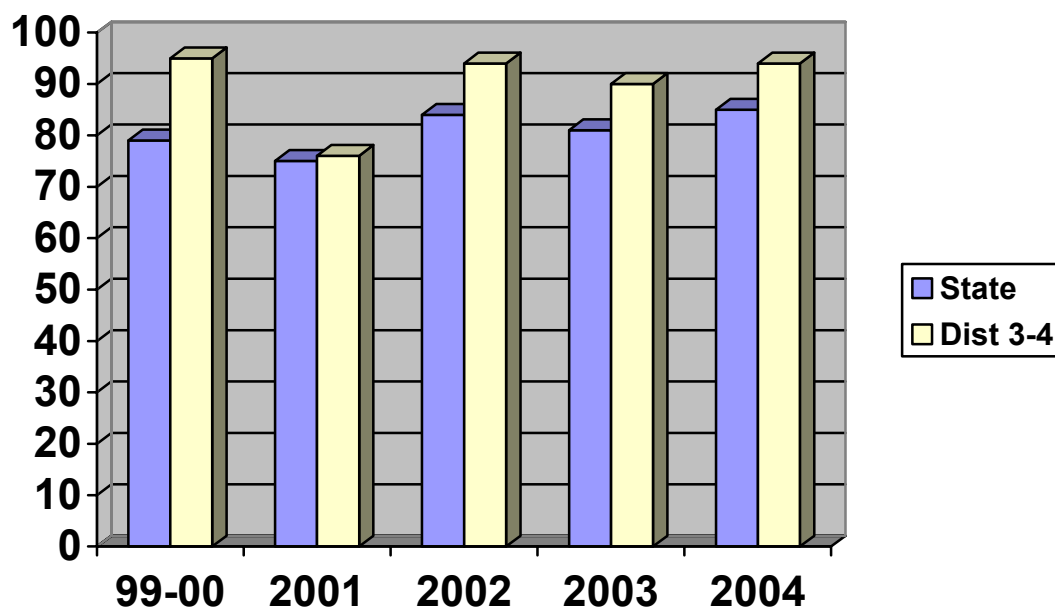
Table 49 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 3-3, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-4

The eligible sample from this district included 185 children born in January 2002. From the 185 children, 167 records were located (Response Rate=90.3%). Of the 167 located records, there were 14 parental refusals leaving a final sample of 153 records.

- ❖ **The 4:3:1 immunization coverage estimate is 93.5 percent (143/153).**
This rate is much higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 10: 4:3:1 Coverage for State and District 3-4



- ❖ **The 4:3:1+3 immunization coverage estimate is 91.5 percent (140/153).**
This rate is higher than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 50:
District Immunization Rates for
Health District 3-4 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	94.8%	75.9%	94.9%	90.0%	94.1%
3 OPV/IPV	96.4%	77.2%	96.0%	90.0%	96.1%
1 MMR	96.4%	83.5%	97.1%	90.0%	96.1%
3 Hib	97.5%	92.4%	96.6%	90.0%	96.7%
3 HepB	97.5%	86.1%	94.9%	90.0%	96.7%
1 Varicella	89.5%	86.1%	96.0%	90.0%	94.1%
3 PCV	---	---	---	---	76.5%
4 PCV	---	---	---	---	40.5%

*PCV data not collected before 2004.

Table 50 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 40.5 to 96.7 percent for the 2004 study data.

Table 51 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 51:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-4

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	150	98.0%
DTP2/DTaP2	146	95.4%
DTP3/DTaP3	137	89.5%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	150	98.0%
OPV/IPV2	146	95.4%
OPV/IPV3	73	47.7%
OPV/IPV4	0	0.0%
MMR1	7	4.6%
MMR2	0	0.0%
HIB1	150	98.0%
HIB2	145	94.8%
HIB3	63	41.2%
HIB4	1	0.7%
HIB5	0	0.0%
HEPB1	150	98.0%
HEPB2	148	96.7%
HEPB3	77	50.3%
HEPB4	5	3.3%
VAR1	8	5.2%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 153

Table 52:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 3-4 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	43/56 (76.8)	122/127 (96.1)	37/42 (88.1)	106/115 (92.2)
Black	12/17 (70.6)	30/35 (85.7)	10/12 (83.3)	26/27 (96.3)
Other	5/6 (83.3)	11/11 (100.0)	5/6 (83.3)	11/11 (100.0)
Unknown	---	2/2 (100.0)	---	---
Total	60/79 (75.9)	165/175 (94.3)	52/60 (86.7)	143/153 (93.5)

Table 52 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 52 shows that in the 2004 study year, the immunization rates of children born to black mothers was greater than that of white mothers.

Table 53:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 3-4 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)
Less than high school	2/3 (66.7)	4/5 (80.0)	1/1 (100.0)	2/2 (100.0)
Some high school	7/11 (63.6)	15/18 (83.3)	3/3 (100.0)	12/14 (85.7)
High school graduate	16/25 (64.0)	58/61 (95.1)	17/21 (81.0)	35/35 (100.0)
Some college	8/10 (80.0)	27/29 (93.1)	9/10 (90.0)	29/33 (87.9)
College or more	27/30 (90.0)	55/56 (98.2)	22/25 (88.0)	65/69 (94.2)
Unknown	---	6/6 (100.0)	---	---
Total	60/79 (75.9)	165/175 (94.3)	52/60 (86.7)	143/153 (93.5)

Table 53 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in District 3-4 appears to vary with educational attainment of the mother.

Table 54:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 3-4

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	41/46 (89.1)	17/19 (89.5)	59/65 (90.8)
Non-Medicaid	124/129 (96.1)	35/41 (85.4)	84/88 (95.5)
Total	165/175 (94.3)	52/60 (86.7)	143/153 (93.5)

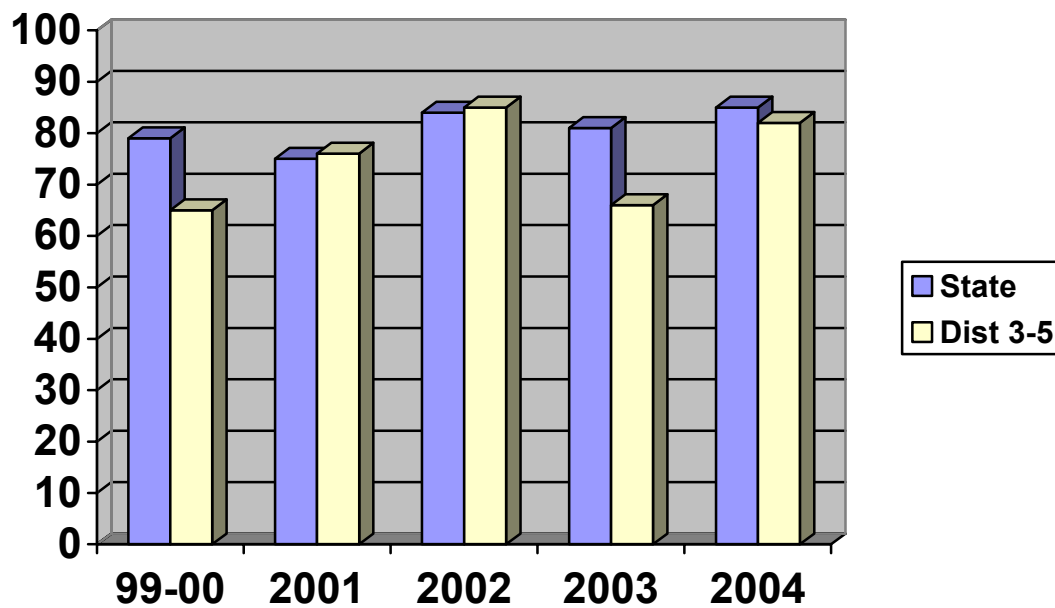
Table 54 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. In the 2004 study, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 3-5

The eligible sample from this district included 435 children born in January 2002. From the 435 children, 240 records were located (Response Rate=55.2%). Of the 240 located records, there was 1 parental refusal leaving a final sample of 239 records.

- ❖ **The 4:3:1 immunization coverage estimate is 82.0 percent (196/239).**
This rate is lower than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 11: 4:3:1 Coverage for State and District 3-5



- ❖ **The 4:3:1+3 immunization coverage estimate is 74.9 percent (179/239).**
This rate is also much lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 55:
District Immunization Rates for
Health District 3-5 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	66.2%	77.0%	84.6%	66.0%	82.4%
3 OPV/IPV	75.7%	83.7%	88.7%	82.0%	89.5%
1 MMR	71.6%	87.8%	86.7%	80.7%	90.8%
3 Hib	77.0%	89.3%	86.2%	76.0%	88.3%
3 HepB	77.9%	88.8%	85.6%	78.0%	89.1%
1 Varicella	57.2%	81.1%	83.6%	74.0%	89.5%
3 PCV	---	---	---	---	43.5%
4 PCV	---	---	---	---	19.7%

*PCV data not collected before 2004.

Table 55 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 19.7 to 90.8 percent for the 2004 study data.

Table 56 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 56:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 3-5

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	231	96.7%
DTP2/DTaP2	225	94.1%
DTP3DTaP3	202	84.5%
DTP4/DTaP4	3	1.3%
DTP5/DTaP5	0	0.0%
OPV/IPV1	232	97.1%
OPV/IPV2	224	93.7%
OPV/IPV3	110	46.0%
OPV/IPV4	1	0.4%
MMR1	13	5.4%
MMR2	0	0.0%
HIB1	226	94.6%
HIB2	219	91.6%
HIB3	103	43.1%
HIB4	2	0.8%
HIB5	0	0.0%
HEPB1	232	97.1%
HEPB2	223	93.3%
HEPB3	103	43.1%
HEPB4	2	0.8%
VAR1	15	6.3%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 239

Table 57:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 3-5 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)	#/Total (Percent)
White	38/52 (73.1)	51/63 (81.0)	36/45 (80.0)	62/74 (83.8)
Black	100/130 (76.9)	101/117 (86.3)	53/100 (53.0)	123/154 (80.0)
Other	10/14 (71.4)	9/10 (90.0)	2/5 (40.0)	11/11 (100.0)
Unknown	---	4/5 (80.0)	---	---
Total	148/196 (75.5)	165/195 (84.6)	91/150 (60.7)	196/239 (82.0)

Table 57 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 57 shows that the number of white mothers was less than that of black mothers in each year. The immunization rates of children in District 3-5 varied with maternal race with no clear trend emerging.

Table 58:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 3-5 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	12/17 (70.6)	11/15 (73.3)	2/5 (40.0)	5/6 (83.3)
Some high school	17/25 (68.0)	19/22 (86.4)	9/13 (69.2)	27/37 (73.0)
High school graduate	43/59 (72.9)	40/48 (83.3)	22/42 (52.4)	49/59 (83.1)
Some college	33/46 (71.7)	38/49 (77.6)	21/39 (53.8)	43/49 (87.8)
College or more	43/49 (87.8)	51/54 (94.4)	37/51 (72.5)	72/88 (81.8)
Unknown	---	6/7 (85.7)	---	---
Total	148/196 (75.5)	165/195 (84.6)	91/150 (60.7)	196/239 (82.0)

Table 58 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ In all study years, the immunization status of the children in District 3-5 varied with level of maternal educational attainment.

Table 59:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 3-5

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	66/82 (80.5)	36/72 (50.0)	95/117 (81.2)
Non-Medicaid	99/113 (87.6)	55/78 (70.5)	101/122 (82.8)
Total	165/195 (84.6)	91/150 (60.7)	196/239 (82.0)

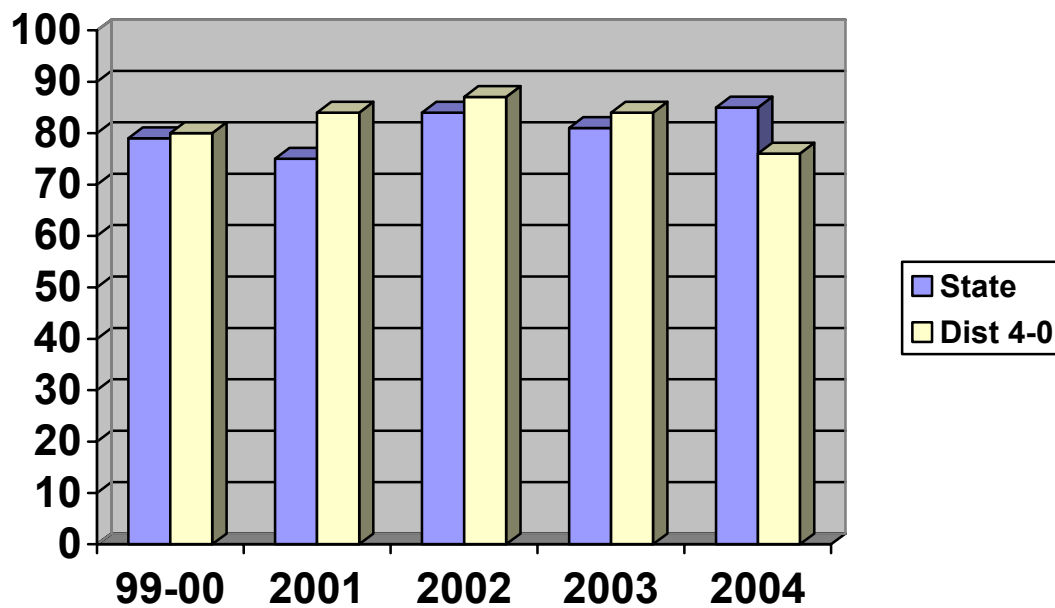
Table 59 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 3-5, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Individual Health District Report: District 4-0

The eligible sample from this district included 236 children born in January 2002. From the 236 children, 189 records were located (Response Rate=80.1%). Of the 189 located records, there were 2 parental refusals leaving a final sample of 187 records.

- ❖ **The 4:3:1 immunization coverage estimate is 77.5 percent (145/187).**
This rate is lower than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 12: 4:3:1 Coverage for State and District 4-0



- ❖ **The 4:3:1+3 immunization coverage estimate is 74.9 percent (140/187).**
This rate is lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 60:
District Immunization Rates for
Health District 4-0 by Study Year

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	79.7%	83.5%	87.8%	84.5%	79.1%
3 OPV/IPV	85.9%	86.4%	92.5%	92.7%	85.6%
1 MMR	84.9%	86.4%	93.2%	92.7%	85.0%
3 Hib	88.5%	88.3%	93.2%	87.3%	86.6%
3 HepB	85.9%	88.8%	92.5%	92.7%	86.1%
1 Varicella	65.6%	83.0%	92.5%	92.7%	85.0%
3 PCV	---	---	---	---	32.1%
4 PCV	---	---	---	---	9.1%

*PCV data not collected before 2004.

Table 60 reveals the coverage rates of each vaccine series. Coverage rates ranged from 9.1 to 86.6 percent for the 2004 study data.

Table 61 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 61:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 4-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	183	97.9%
DTP2/DTaP2	173	92.5%
DTP3/DTaP3	155	82.9%
DTP4/DTaP4	1	0.5%
DTP5/DTaP5	0	0.0%
OPV/IPV1	182	97.3%
OPV/IPV2	172	92.0%
OPV/IPV3	75	40.1%
OPV/IPV4	1	0.5%
MMR1	5	2.7%
MMR2	0	0.0%
HIB1	181	96.8%
HIB2	173	92.5%
HIB3	70	37.4%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	181	96.8%
HEPB2	176	94.1%
HEPB3	74	39.6%
HEPB4	3	1.6%
VAR1	8	4.3%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 187

Table 62:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 4-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	115/138 (83.3)	89/99 (89.9)	57/68 (83.8)	108/141 (76.6)
Black	54/65 (83.1)	39/47 (83.0)	29/42 (69.0)	34/43 (79.1)
Other	3/3 (100.0)	0/1 (0.0)	---	3/3 (100.0)
Total	172/206 (83.5)	128/147 (87.1)	86/110 (78.2)	145/187 (77.5)

Table 62 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 62 shows that in 2002 and 2003, the immunization rate of children born to white mothers was higher than that of children born to black mothers. However, in the 2004 study year children born to black mothers had a slightly higher immunization rate than children born to white mothers.

Table 63:

**Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 4-0 by Study Year**

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/5 (80.0)	2/2 (100.0)	4/4 (100.0)	1/1 (100.0)
Some high school	43/49 (87.8)	37/44 (84.1)	21/29 (72.4)	21/28 (75.0)
High school graduate	69/84 (82.1)	44/52 (84.6)	28/33 (84.8)	57/71 (80.3)
Some college	32/41 (78.0)	24/26 (92.3)	15/20 (75.0)	23/32 (71.9)
College or more	24/27 (88.9)	21/23 (91.3)	18/24 (75.0)	43/55 (78.2)
Unknown	---	---	---	
Total	172/206 (83.5)	128/147 (87.1)	86/110 (78.2)	145/187 (77.5)

Table 63 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in the sample in District 4-0 appears to vary with educational attainment.

Table 64:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 4-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	62/71 (87.3)	53/69 (76.8)	76/95 (80.0)
Non-Medicaid	66/76 (86.8)	33/41 (80.5)	69/92 (75.0)
Total	128/147 (87.1)	86/110 (78.2)	145/187 (77.5)

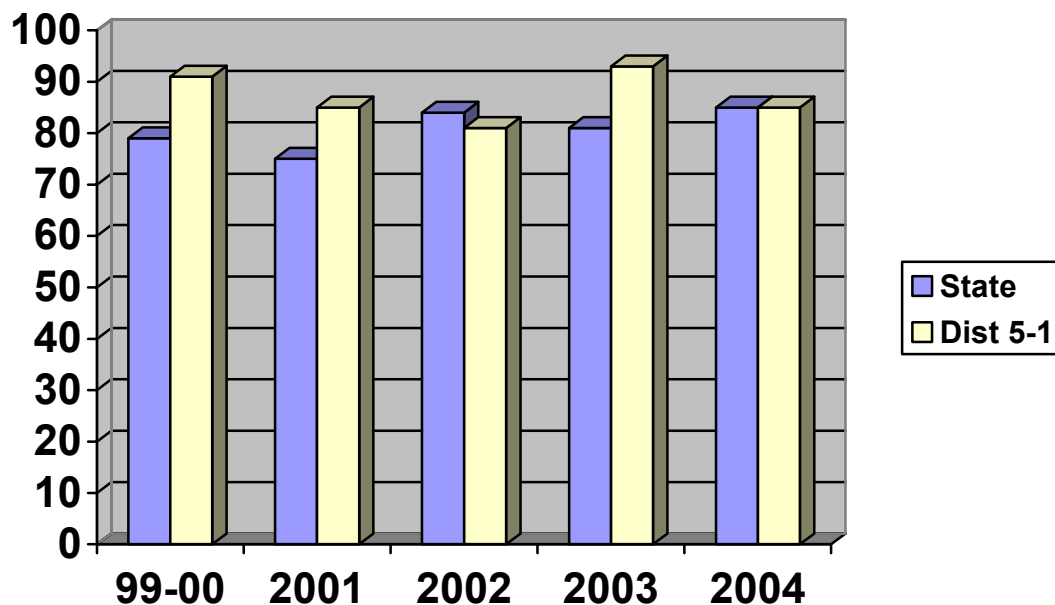
Table 64 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. The immunization rate of children born to non-Medicaid women did not vary significantly from the immunization rate of children born to women using Medicaid.

Individual Health District Report: District 5-1

The eligible sample from this district included 60 children born in January 2002. From the 60 children, 55 records were located (Response Rate=98.9%). Of the 91 located records, there was 0 parental refusals leaving a final sample of 55 records.

- ❖ **The 4:3:1 immunization coverage estimate is 85.5 percent (47/55).** This rate is similar to the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 13: 4:3:1 Coverage for State and District 5-1



- ❖ **The 4:3:1+3 immunization coverage estimate 80.0 percent (44/55).** This rate is lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 65:
District Immunization Rates for
Health District 5-1 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	91.3%	86.7%	80.8%	93.3%	85.5%
3 OPV/IPV	93.8%	93.3%	96.2%	97.8%	92.7%
1 MMR	96.3%	91.7%	97.4%	97.8%	90.9%
3 Hib	96.3%	91.7%	97.4%	97.8%	87.3%
3 HepB	96.3%	93.3%	96.2%	96.7%	90.9%
1 Varicella	61.3%	86.7%	84.6%	95.6%	90.9%
3 PCV	---	---	---	---	23.6%
4 PCV	---	---	---	---	3.6%

*PCV data not collected before 2004.

Table 65 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 3.6 to 92.7 percent for the 2004 study data.

Table 66 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 66:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 5-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	54	98.2%
DTP2/DTaP2	51	92.7%
DTP3/DTaP3	45	81.8%
DTP4/DTaP4	1	1.8%
DTP5/DTaP5	0	0.0%
OPV/IPV1	54	98.2%
OPV/IPV2	51	92.7%
OPV/IPV3	28	50.9%
OPV/IPV4	0	0.0%
MMR1	1	1.8%
MMR2	0	0.0%
HIB1	54	98.2%
HIB2	50	90.9%
HIB3	16	29.1%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	54	98.2%
HEPB2	50	90.9%
HEPB3	22	40.0%
HEPB4	0	0.0%
VAR1	4	7.3%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 55

Table 67:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 5-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	32/36 (88.9)	34/44 (77.3)	56/64 (87.5)	27/32 (84.4)
Black	19/24 (79.2)	29/34 (85.3)	19/25 (76.0)	20/23 (87.0)
Other	---	---	1/1 (100.0)	---
Total	51/60 (85.0)	63/78 (80.8)	76/90 (84.4)	47/55 (85.5)

Table 67 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 67 shows that the number of white mothers was greater than that of black mothers. The immunization rates for District 5-1 vary with maternal race with no clear trend emerging.

Table 68:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 5-1

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	2/2 (100.0)	1/2 (50.0)	---	---
Some high school	13/19 (68.4)	23/26 (88.5)	13/16 (81.3)	9/10 (90.0)
High school graduate	19/21 (90.5)	28/36 (77.8)	30/36 (83.3)	18/23 (78.3)
Some college	11/12 (91.7)	3/3 (100.0)	10/12 (83.3)	8/9 (88.9)
College or more	6/6 (100.0)	8/11 (72.7)	23/26 (88.5)	12/13 (92.3)
Unknown	---	---	---	---
Total	51/60 (85.0)	63/78 (80.8)	76/90 (84.4)	47/55 (85.5)

Table 68 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years of the study, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in the sample in District 5-1 varies with educational attainment.

Table 69:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 5-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	35/43 (81.4)	37/48 (77.1)	34/40 (80.0)
Non-Medicaid	28/35 (80.0)	39/42 (92.9)	13/15 (86.7)
Total	63/78 (80.8)	76/90 (84.4)	47/55 (85.5)

Table 69 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. The immunization rates for District 5-1 vary with maternal Medicaid status.

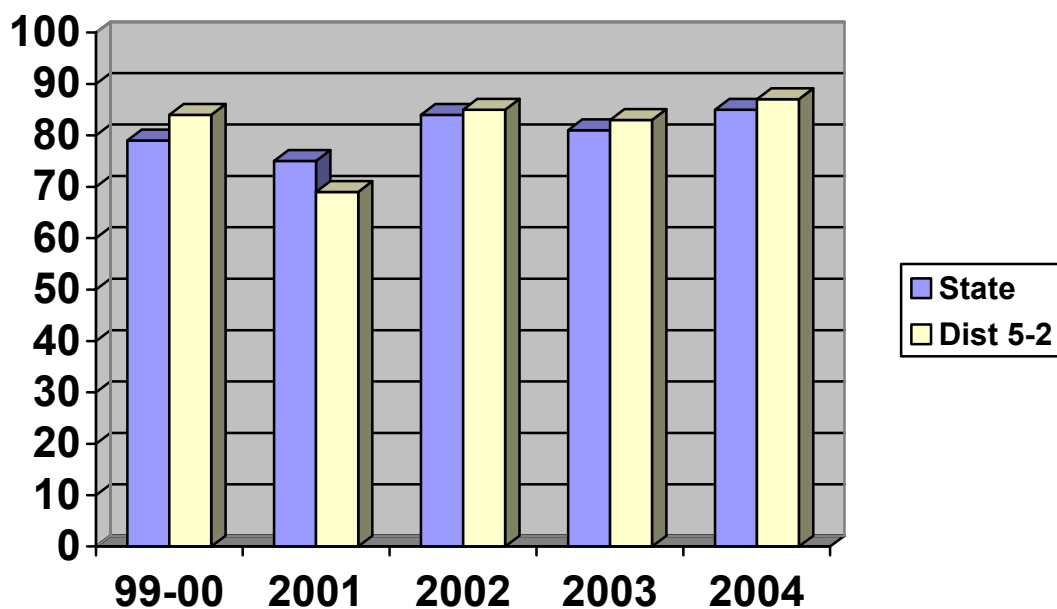
Individual Health District Report: District 5-2

The eligible sample from this district included 184 children born in January 2002. From the 184 children, 148 records were located (Response Rate=80.4%). Of the 148 located records, there was 1 parental refusal leaving a final sample of 147 records.

- ❖ **The 4:3:1 immunization coverage estimate is 87.1 percent (128/147).**

This rate is higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 14: 4:3:1 Coverage for State and District 5-2



- ❖ **The 4:3:1+3 immunization coverage estimate is 83.7 percent (123/147).**

This rate is higher to the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 70:
District Immunization Rates for
Health District 5-2 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	83.6%	72.7%	85.5%	84.9%	87.1%
3 OPV/IPV	87.3%	81.8%	94.0%	93.7%	93.2%
1 MMR	90.9%	82.7%	92.3%	96.8%	93.2%
3 Hib	96.4%	84.5%	92.7%	91.3%	91.2%
3 HepB	89.1%	83.6%	93.1%	93.7%	91.8%
1 Varicella	61.8%	80.0%	90.3%	92.9%	91.2%
3 PCV	---	---	---	---	39.5%
4 PCV	---	---	---	---	15.0%

*PCV data not collected before 2004.

Table 70 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 15.0 to 93.2 percent for the 2004 study data.

Table 71 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. The Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 71:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 5-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	142	96.2%
DTP2/DTaP2	140	95.2%
DTP3/DTaP3	124	84.4%
DTP4/DTaP4	6	4.1%
DTP5/DTaP5	0	0.0%
OPV/IPV1	144	98.0%
OPV/IPV2	140	95.2%
OPV/IPV3	76	51.7%
OPV/IPV4	0	0.0%
MMR1	15	10.2%
MMR2	0	0.0%
HIB1	144	98.0%
HIB2	140	95.2%
HIB3	59	40.1%
HIB4	5	3.4%
HIB5	0	0.0%
HEPB1	143	97.3%
HEPB2	141	95.9%
HEPB3	72	49.0%
HEPB4	1	0.7%
VAR1	8	5.4%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 147

Table 72:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 5-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	33/52 (63.5)	109/123 (88.6)	55/68 (80.9)	63/71 (88.8)
Black	43/58 (74.1)	96/120 (80.0)	41/56 (73.2)	62/73 (85.0)
Other	---	4/4 (100.0)	2/2 (100.0)	3/3 (100.0)
Unknown	----	1/1 (100.0)	---	---
Total	76/110 (69.1)	210/248 (84.7)	98/126 (77.8)	128/147 (87.1)

Table 72 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization rates for District 5-2 vary with maternal race with no clear trend emerging.

Table 73:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 5-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	1/4 (25.0)	1/4 (25.0)	---	1/1 (100.0)
Some high school	13/17 (76.5)	13/17 (76.5)	18/23 (78.3)	22/23 (95.7)
High school graduate	41/53 (77.4)	41/53 (77.4)	30/42 (71.4)	47/53 (88.7)
Some college	12/23 (52.2)	12/23 (52.2)	26/33 (78.8)	31/40 (78.0)
College or more	9/13 (69.2)	9/13 (69.2)	24/28 (85.7)	27/30 (90.0)
Total	76/110 (69.1)	76/110 (69.1)	98/126 (77.8)	128/147 (87.1)

Table 73 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in District 5-2 varied with maternal educational attainment.

Table 74:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 5-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	103/131 (78.6)	48/70 (68.6)	79/91 (86.8)
Non-Medicaid	107/117 (91.5)	50/56 (89.3)	49/56 (88.0)
Total	210/248 (84.7)	98/126 (77.8)	128/147 (87.1)

Table 74 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. In all study years, children born to women not using Medicaid had a higher immunization rate than children born to Medicaid women.

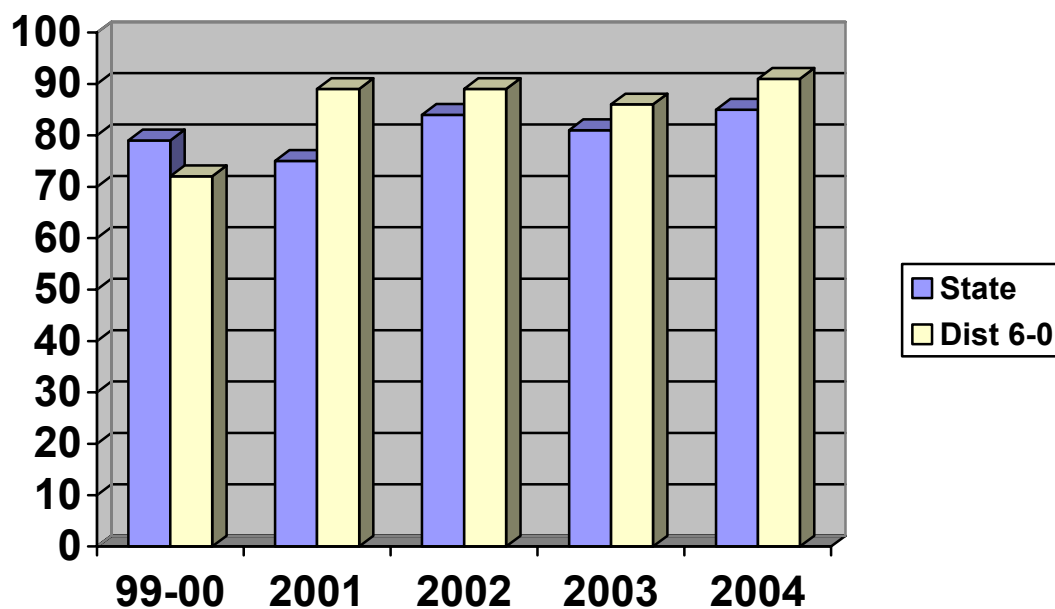
Individual Health District Report: District 6-0

The eligible sample from this district included 142 children born in January 2002. From the 142 children, 116 records were located (Response Rate=81.7%). Of the 116 located records, there were 0 parental refusals leaving a final sample of 116 records.

- ❖ **The 4:3:1 immunization coverage estimate is 90.5 percent (105/116).**

This rate is higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 15: 4:3:1 Coverage for State and District 6-0



- ❖ **The 4:3:1+3 immunization coverage estimate is 85.3 percent (99/116).**

This rate is higher than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 75:
District Immunization Rates for
Health District 6-0 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	74.5%	89.5%	89.2%	87.8%	90.5%
3 OPV/IPV	85.1%	93.2%	95.1%	91.9%	94.8%
1 MMR	87.2%	95.1%	96.1%	91.9%	95.7%
3 Hib	87.2%	97.5%	97.1%	93.5%	92.2%
3 HepB	85.1%	93.2%	96.1%	95.1%	94.0%
1 Varicella	61.7%	88.3%	97.1%	90.2%	94.8%
3 PCV	---	---	---	---	54.3%
4 PCV	---	---	---	---	23.3%

*PCV data not collected before 2004.

Table 75 reveals the coverage rates of each vaccine series. Coverage rates ranged from 23.3 to 95.7 percent for the 2004 study data.

Table 76 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 76:
2004 District Immunization Rates by Individual Vaccine at
12 months of age for Health District 6-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	111	95.7%
DTP2/DTaP2	106	91.4%
DTP3/DTaP3	101	87.1%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	111	95.7%
OPV/IPV2	107	92.2%
OPV/IPV3	50	43.1%
OPV/IPV4	0	0.0%
MMR1	0	0.0%
MMR2	0	0.0%
HIB1	112	96.6%
HIB2	107	92.2%
HIB3	68	58.6%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	113	97.4%
HEPB2	110	94.8%
HEPB3	65	56.0%
HEPB4	3	2.6%
VAR1	4	3.4%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 116

Table 77:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 6-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	57/65 (87.7)	39/42 (92.9)	51/61 (83.6)	53/56 (94.6)
Black	86/96 (89.6)	52/60 (86.7)	48/59 (81.4)	49/57 (86.0)
Other	1/1 (100.0)	---	3/3 (100.0)	3/3 (100.0)
Total	144/162 (88.9)	91/102 (89.2)	102/123 (82.9)	105/116 (90.5)

Table 77 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 77 shows that the immunization rates of children in District 6-0 varied with maternal race.

Table 78:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 6-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	10/12 (83.3)	3/3 (100.0)	0/1 (0.0)	---
Some high school	32/38 (84.2)	18/21 (85.7)	18/21 (81.8)	23/24 (95.8)
High school graduate	47/52 (90.4)	37/42 (88.1)	35/44 (79.5)	32/37 (86.5)
Some college	34/35 (97.1)	18/19 (94.7)	23/26 (88.5)	19/20 (95.0)
College or more	21/25 (84.0)	15/17 (88.2)	26/30 (86.7)	31/35 (88.6)
Total	144/162 (88.9)	91/102 (89.2)	102/123 (82.9)	105/116 (90.5)

Table 78 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in District 6-0 varies with educational attainment.

Table 79:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 6-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	53/61 (86.9)	69/83 (83.1)	60/68 (88.2)
Non-Medicaid	38/41 (92.7)	33/40 (82.5)	45/48 (93.8)
Total	91/102 (89.2)	102/123 (82.9)	105/116 (90.5)

Table 79 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. Table 79 shows that the immunization rates of children in District 6-0 vary with maternal Medicaid status.

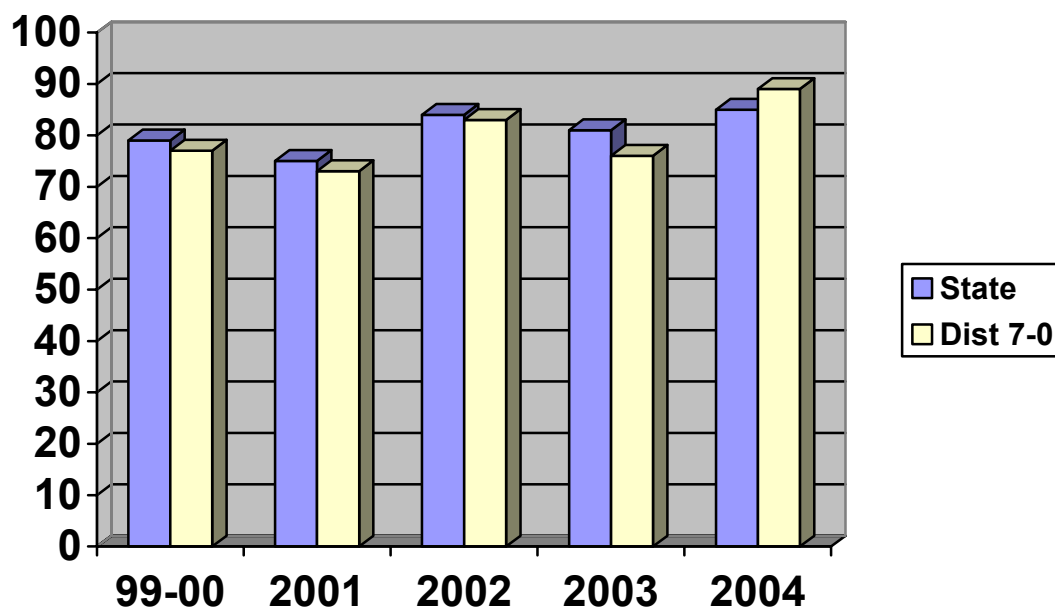
Individual Health District Report: District 7-0

The eligible sample from this district included 243 children born in January 2002. From the 243 children, 201 records were located (Response Rate=82.7%). Of the 201 located records, there were 2 parental refusals leaving a final sample of 199 records.

- ❖ **The 4:3:1 immunization coverage estimate is 88.4 percent (176/199).**

This rate is higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 16: 4:3:1 Coverage for State and District 7-0



- ❖ **The 4:3:1+3 immunization coverage estimate is 82.9 percent (165/199).**

This rate is slightly higher to the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 80:
District Immunization Rates for
Health District 7-0 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	77.1%	74.3%	83.6%	77.1%	88.4%
3 OPV/IPV	85.9%	78.4%	90.5%	85.0%	93.5%
1 MMR	85.3%	80.2%	92.2%	87.9%	93.0%
3 Hib	85.3%	82.6%	89.7%	85.7%	93.0%
3 HepB	87.6%	85.0%	90.5%	87.9%	93.5%
1 Varicella	53.5%	74.9%	88.8%	85.7%	93.5%
3 PCV	---	---	---	---	34.2%
4 PCV	---	---	---	---	10.1%

*PCV data not collected before 2004.

Table 80 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 10.1 to 93.5 percent for the 2004 study data.

Table 81 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 81:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 7-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	195	98.0%
DTP2/DTaP2	190	95.5%
DTP3/DTaP3	170	85.4%
DTP4/DTaP4	1	0.5%
DTP5/DTaP5	0	0.0%
OPV/IPV1	195	98.0%
OPV/IPV2	190	95.5%
OPV/IPV3	65	32.7%
OPV/IPV4	0	0.0%
MMR1	3	1.5%
MMR2	0	0.0%
HIB1	195	98.0%
HIB2	188	94.5%
HIB3	94	47.2%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	195	98.0%
HEPB2	190	95.5%
HEPB3	111	55.8%
HEPB4	2	1.0%
VAR1	3	1.5%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 199

Table 82:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 7-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	43/64 (67.2)	36/44 (81.8)	26/38 (68.4)	79/86 (91.9)
Black	78/101 (77.2)	60/72 (83.3)	74/102 (72.5)	94/110 (85.5)
Other	1/2 (50.0)	---	---	3/3 (100.0)
Total	122/167 (73.1)	96/116 (82.8)	100/140 (71.4)	176/199 (88.4)

Table 82 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 82 shows that for the 2001 through 2003 study years, the immunization rate of children born to black mothers was greater than white mothers. However, this trend was reversed in the 2004 study year.

Table 83:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 7-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	4/6 (66.7)	3/3 (100.0)	1/1 (100.0)	2/2 (100.0)
Some high school	41/53 (77.4)	34/40 (85.0)	23/38 (60.5)	44/52 (84.6)
High school graduate	55/72 (76.4)	35/42 (83.3)	36/51 (70.6)	56/62 (90.3)
Some college	10/13 (76.9)	18/23 (78.3)	21/24 (87.5)	41/46 (89.1)
College or more	12/23 (52.2)	6/7 (85.7)	19/26 (73.1)	33/37 (89.2)
Unknown	---	0/1 (0.0)	---	---
Total	122/167 (73.1)	96/116 (82.8)	100/140 (71.4)	176/199 (88.4)

Table 83 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in District 7-0 varies with maternal educational attainment.

Table 84:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 7-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	70/83 (84.3)	75/101 (74.3)	127/147 (86.4)
Non-Medicaid	26/33 (78.8)	25/39 (64.1)	49/52 (94.2)
Total	96/116 (82.8)	100/140 (71.4)	176/199 (88.4)

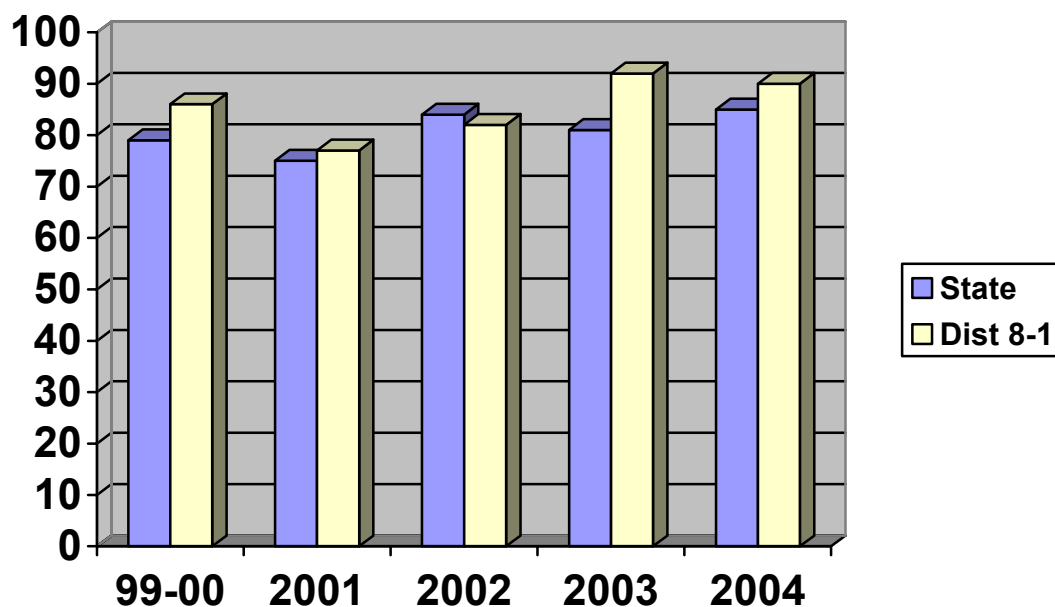
Table 84 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 7-0, immunization rates of children vary with maternal Medicaid status.

Individual Health District Report: District 8-1

The eligible sample from this district included 81 children born in January 2002. From the 81 children, 76 records were located (Response Rate=93.8%). Of the 76 located records, there were no parental refusals leaving a final sample of 76 records.

- ❖ **The 4:3:1 immunization coverage estimate is 89.5 percent (68/76).** This rate is higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 17: 4:3:1 Coverage for State and District 8-1



- ❖ **The 4:3:1+3 immunization coverage estimate is 89.5 percent (68/76).** This rate is higher than the statewide 4:3:1+3 immunization rate of percent 81.3.

Table 85:
District Immunization Rates for
Health District 8-1 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	86.9%	77.7%	82.2%	91.9%	89.5%
3 OPV/IPV	87.9%	84.5%	91.5%	96.0%	96.1%
1 MMR	90.7%	82.5%	93.8%	95.2%	92.1%
3 Hib	92.5%	81.6%	94.6%	95.2%	94.7%
3 HepB	92.5%	84.5%	94.6%	96.0%	96.1%
1 Varicella	61.7%	78.6%	93.0%	94.4%	92.1%
3 PCV	---	---	---	---	39.5%
4 PCV	---	---	---	---	13.2%

*PCV data not collected before 2004.

Table 85 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 13.2 to 96.1 percent for the 2004 study data.

Table 86 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 86:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 8-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	76	100.0%
DTP2/DTaP2	75	98.7%
DTP3/DTaP3	65	85.5%
DTP4/DTaP4	1	1.3%
DTP5/DTaP5	0	0.0%
OPV/IPV1	76	100.0%
OPV/IPV2	75	98.7%
OPV/IPV3	28	36.8%
OPV/IPV4	1	1.3%
MMR1	3	3.9%
MMR2	0	0.0%
HIB1	76	100.0%
HIB2	75	98.7%
HIB3	27	35.5%
HIB4	1	1.3%
HIB5	0	0.0%
HEPB1	76	100.0%
HEPB2	75	98.7%
HEPB3	36	47.4%
HEPB4	2	2.6%
VAR1	5	6.6%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 76

Table 87:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 8-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	42/60 (70.0)	67/80 (83.8)	59/69 (85.5)	48/51 (94.1)
Black	36/42 (85.7)	38/48 (79.2)	45/53 (84.9)	19/24 (79.2)
Other	1/1 (100.0)	1/1 (100.0)	2/2 (100.0)	1/1 (100.0)
Total	79/103 (76.7)	106/129 (82.2)	106/124 (85.5)	68/76 (89.5)

Table 87 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 87 shows that the immunization rate of children varies with maternal race in District 8-1.

Table 88:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 8-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	9/13 (69.2)	6/9 (66.7)	---	1/1 (100.0)
Some high school	19/26 (73.1)	29/35 (82.9)	19/23 (82.6)	17/19 (89.5)
High school graduate	27/34 (79.4)	34/40 (85.0)	41/47 (87.2)	15/18 (83.3)
Some college	17/22 (77.3)	22/27 (81.5)	17/19 (89.5)	19/20 (95.0)
College or more	7/8 (87.5)	15/18 (83.3)	29/35 (82.9)	16/18 (88.9)
Total	79/103 (76.7)	106/129 (82.2)	106/124 (85.5)	68/76 (89.5)

Table 88 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in the sample in District 8-1 varies with educational attainment.

Table 89:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 8-1

	2002	2003	2004
	4:3:1 Adequate	4:3:1 Adequate	4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	64/74 (86.5)	80/92 (87.0)	42/48 (87.5)
Non-Medicaid	42/55 (76.4)	26/32 (81.3)	26/28 (92.9)
Total	106/129 (82.2)	106/124 (85.5)	68/76 (89.5)

Table 89 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. Table 89 shows that the immunization rates of children in District 8-1 vary with maternal Medicaid status.

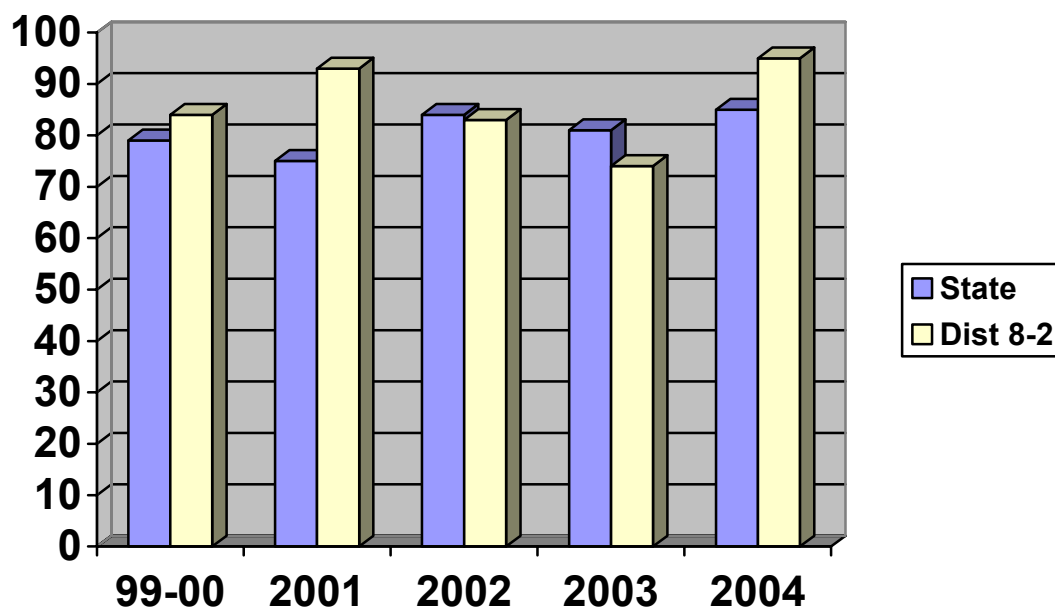
Individual Health District Report: District 8-2

The eligible sample from this district included 189 children born in January 2002. From the 189 children, 175 records were located (Response Rate=92.6%). Of the 175 located records, there was no parental refusals leaving a final sample of 175 records.

- ❖ **The 4:3:1 immunization coverage estimate is 94.9 percent (166/175).**

This rate is higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 18: 4:3:1 Coverage for State and District 8-2



- ❖ **The 4:3:1+3 immunization coverage estimate rate is 93.1 percent (163/175).** This rate is much higher than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 90:
District Immunization Rates for
Health District 8-2 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	85.6%	94.7%	85.7%	75.3%	94.9%
3 OPV/IPV	90.8%	96.2%	90.9%	80.7%	97.7%
1 MMR	88.9%	97.0%	92.2%	81.3%	97.7%
3 Hib	92.8%	92.5%	92.2%	81.3%	98.3%
3 HepB	90.2%	95.5%	92.2%	82.0%	97.7%
1 Varicella	66.0%	96.2%	90.9%	78.0%	97.7%
3 PCV	---	---	---	---	38.9%
4 PCV	---	---	---	---	8.0%

*PCV data not collected before 2004.

Table 90 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 8.0 to 98.3 percent for the 2004 study data.

Table 91 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 91:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 8-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	175	100.0%
DTP2/DTaP2	173	98.9%
DTP3/DTaP3	161	92.0%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	175	100.0%
OPV/IPV2	171	97.7%
OPV/IPV3	92	52.6%
OPV/IPV4	1	0.6%
MMR1	8	4.6%
MMR2	0	0.0%
HIB1	175	100.0%
HIB2	170	97.1%
HIB3	82	46.9%
HIB4	2	1.1%
HIB5	0	0.0%
HEPB1	174	99.4%
HEPB2	171	97.7%
HEPB3	114	65.1%
HEPB4	1	0.6%
VAR1	11	6.3%
VAR2	0	0.0%

*Percent = number immunized / sample size

Sample size = 175

Table 92:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 8-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	55/58 (94.8)	21/28 (75.0)	47/78 (60.3)	83/88 (94.3)
Black	67/73 (91.8)	40/46 (87.0)	50/71 (70.4)	83/87 (95.4)
Other	2/2 (100.0)	1/1 (100.0)	0/1 (0.0)	---
Unknown	---	2/2 (100.0)	---	---
Total	124/133 (93.2)	64/77 (83.1)	97/150 (64.7)	166/175 (94.9)

Table 92 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 92 shows that the immunization rates of children in District 8-2 vary with maternal race.

Table 93:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 8-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	9/9 (100.0)	7/10 (70.0)	0/2 (0.0)	2/2 (100.0)
Some high school	39/44 (88.6)	21/24 (87.5)	25/37 (67.6)	41/42 (97.6)
High school graduate	44/48 (91.7)	19/25 (76.0)	30/49 (61.2)	52/56 (92.9)
Some college	22/22 (100.0)	11/12 (91.7)	21/29 (72.4)	39/40 (97.5)
College or more	10/10 (100.0)	6/6 (100.0)	21/33 (63.6)	32/35 (91.4)
Total	124/133 (93.2)	64/77 (83.1)	97/150 (64.7)	166/175 (94.9)

Table 93 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The educational categories were based on those used in previous years, to allow comparisons between the three years. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in District 8-2 varies with educational attainment.

Table 94:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 8-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	43/54 (79.6)	60/87 (70.0)	105/110 (95.5)
Non-Medicaid	21/23 (91.3)	37/63 (58.7)	61/65 (93.8)
Total	64/77 (83.1)	97/150 (64.7)	166/175 (94.9)

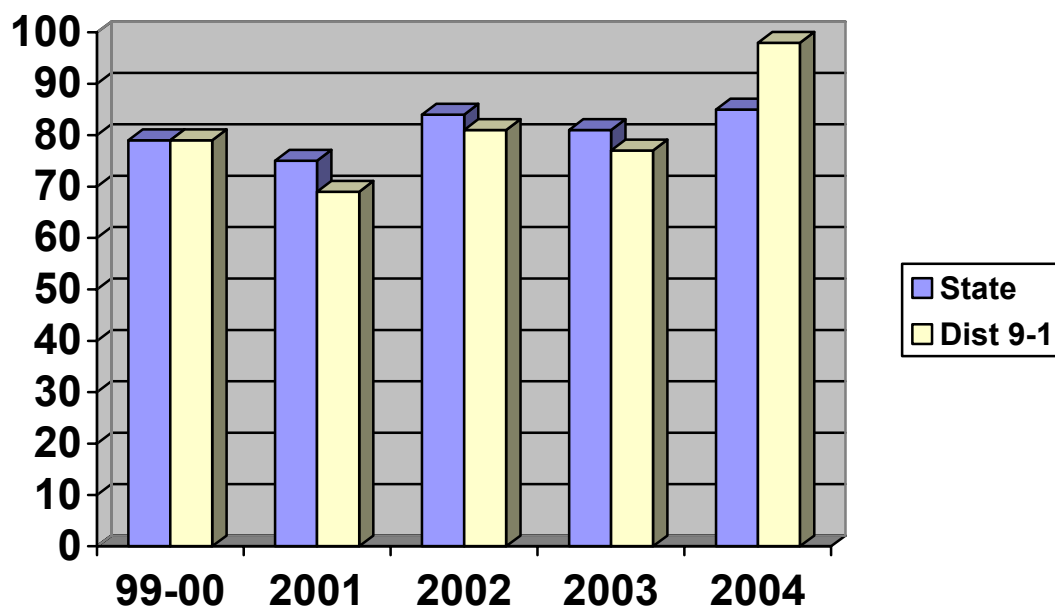
Table 94 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. In the 2004 study year, children born to Medicaid women had a higher immunization rate than children born to women not using Medicaid.

Individual Health District Report: District 9-1

The eligible sample from this district included 173 children born in January 2002. From the 173 children, 81 records were located (Response Rate=46.8%). Of the 81 located records, there were no parental refusals leaving a final sample of 81 records.

- ❖ **The 4:3:1 immunization coverage estimate is 97.5 percent (79/81).** This rate is much higher to the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 19: 4:3:1 Coverage for State and District 9-1



- ❖ **The 4:3:1+3 immunization coverage estimate is 97.5 percent (79/81).** This rate is much higher than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 95:
District Immunization Rates for
Health District 9-1 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	80.8%	69.9%	81.6%	77.3%	97.5%
3 OPV/IPV	88.5%	79.7%	90.1%	88.7%	98.8%
1 MMR	85.4%	79.7%	89.5%	90.0%	98.8%
3 Hib	91.5%	81.3%	90.8%	87.3%	98.8%
3 HepB	89.2%	76.4%	90.1%	79.3%	100%
1 Varicella	51.5%	71.5%	83.6%	83.3%	98.8%
3 PCV	---	---	---	---	53.1%
4 PCV	---	---	---	---	17.3%

*PCV data not collected before 2004.

Table 95 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 17.3 to 100 percent for the 2004 study data.

Table 96 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 96:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-1

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	81	100.0%
DTP2/DTaP2	81	100.0%
DTP3/DTaP3	79	97.5%
DTP4/DTaP4	3	3.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	81	100.0%
OPV/IPV2	81	100.0%
OPV/IPV3	53	65.4%
OPV/IPV4	0	0.0%
MMR1	4	4.9%
MMR2	0	0.0%
HIB1	81	100.0%
HIB2	81	100.0%
HIB3	25	30.9%
HIB4	2	2.5%
HIB5	0	0.0%
HEPB1	81	100.0%
HEPB2	80	98.8%
HEPB3	44	54.3%
HEPB4	1	1.2%
VAR1	4	4.9%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 81

Table 97:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 9-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	36/55 (65.5)	51/65 (78.5)	53/74 (71.6)	23/24 (96.3)
Black	47/66 (71.2)	70/83 (84.3)	55/73 (75.3)	51/52 (98.1)
Other	2/2 (100.0)	0/1 (0.0)	2/3 (66.7)	5/5 (100.0)
Unknown	---	2/3 (66.7)	---	---
Total	85/123 (69.1)	123/152 (80.9)	110/150 (73.3)	79/81 (98.3)

Table 97 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 97 shows that the immunization rate of children born to white mothers was less than that of black mothers in each of the years of the study.

Table 98:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 9-1 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	0/2 (0.0)	2/2 (100.0)	---	---
Some high school	18/22 (81.8)	21/29 (72.4)	10/15 (66.7)	10/10 (100.0)
High school graduate	38/58 (65.5)	50/60 (83.3)	44/61 (72.1)	24/26 (92.3)
Some college	11/22 (50.0)	19/27 (70.4)	22/30 (73.3)	20/20 (100.0)
College or more	18/19 (94.7)	30/33 (90.9)	34/44 (77.3)	25/25 (100.0)
Unknown	---	1/1 (100.0)	---	---
Total	85/123 (69.1)	123/152 (80.9)	110/150 (73.3)	79/81 (97.5)

Table 98 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in the sample in District 9-1 seems to vary with educational attainment.

Table 99:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 9-1

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	69/89 (77.5)	60/86 (69.8)	49/50 (98.0)
Non-Medicaid	54/63 (85.7)	50/64 (78.1)	30/31 (96.8)
Total	123/152 (80.9)	110/150 (73.3)	79/81 (97.5)

Table 99 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 9-1, children born to Medicaid women had a higher immunization rate than children born to women not using Medicaid for all study years.

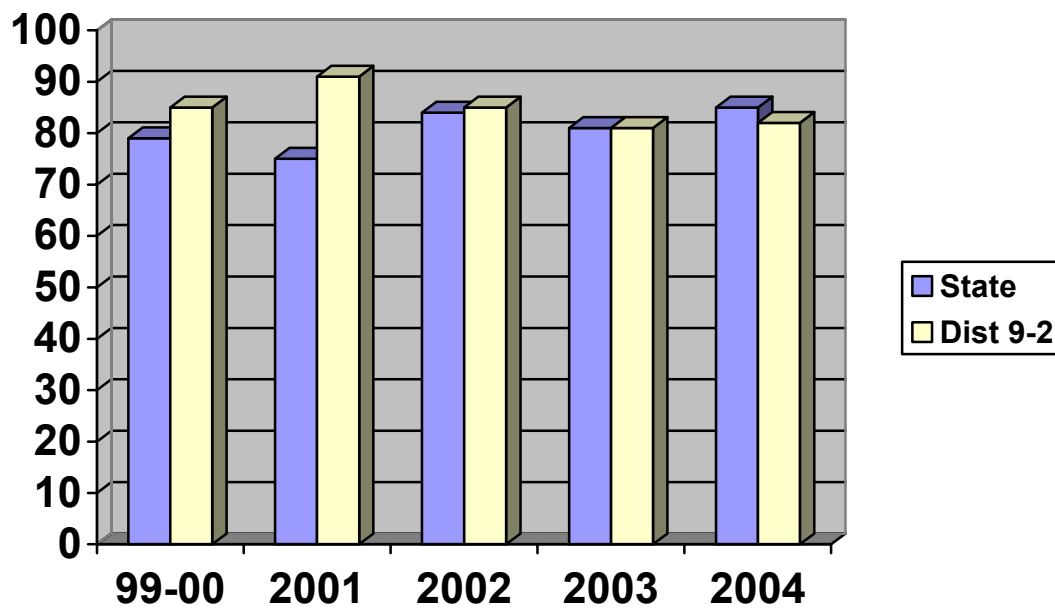
Individual Health District Report: District 9-2

The eligible sample from this district included 156 children born in January 2002. From the 156 children, 135 records were located (Response Rate=86.5%). Of the 135 located records, there were no parental refusals leaving a final sample of 135 records.

- ❖ **The 4:3:1 immunization coverage estimate is 82.2 percent (111/135).**

This rate is lower than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 20: 4:3:1 Coverage for State and District 9-2



- ❖ **The 4:3:1+3 immunization coverage estimate is 78.5 percent (106/135).**

This rate is also lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 100:
District Immunization Rates for
Health District 9-2 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	88.0%	92.4%	86.5%	82.6%	83.0%
3 OPV/IPV	90.2%	92.4%	92.1%	88.4%	90.4%
1 MMR	91.0%	93.1%	94.4%	90.6%	89.6%
3 Hib	95.5%	95.4%	93.3%	86.2%	91.1%
3 HepB	91.7%	95.4%	92.1%	87.7%	90.4%
1 Varicella	58.6%	88.5%	87.6%	91.3%	90.4%
3 PCV	---	---	---	---	39.3%
4 PCV	---	---	---	---	5.2%

*PCV data not collected before 2004.

Table 100 reveals the coverage rates of each vaccine series. Coverage rates ranged from 5.2 to 91.1 percent for the 2004 study data.

Table 101 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 101:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-2

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	132	97.8%
DTP2/DTaP2	127	94.1%
DTP3/DTaP3	115	85.2%
DTP4/DTaP4	1	0.7%
DTP5/DTaP5	0	0.0%
OPV/IPV1	132	97.8%
OPV/IPV2	124	91.9%
OPV/IPV3	31	23.0%
OPV/IPV4	0	0.0%
MMR1	2	1.5%
MMR2	0	0.0%
HIB1	131	97.0%
HIB2	125	92.6%
HIB3	32	23.7%
HIB4	1	0.7%
HIB5	0	0.0%
HEPB1	132	97.8%
HEPB2	128	94.8%
HEPB3	33	24.4%
HEPB4	1	0.7%
VAR1	7	5.2%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 135

Table 102:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 9-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	82/92 (89.1)	50/59 (84.7)	76/104 (73.1)	81/97 (83.5)
Black	36/38 (94.7)	24/28 (85.7)	25/32 (78.1)	29/37 (78.4)
Other	1/1 (100.0)	---	1/2 (50.0)	1/1 (100.0)
Unknown	---	2/2 (100.0)	---	---
Total	119/131 (90.8)	76/89 (85.4)	102/138 (73.9)	111/135 (82.2)

Table 102 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 102 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rate of children born to white mothers was similar to that of black mothers.

Table 103:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 9-2 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	12/12 (100.0)	7/9 (77.8)	1/1 (100.0)	1/1 (100.0)
Some high school	28/33 (84.8)	17/19 (89.5)	10/17 (58.8)	27/35 (77.1)
High school graduate	48/55 (87.3)	33/37 (89.2)	39/59 (66.1)	31/39 (79.5)
Some college	21/21 (100.0)	13/18 (72.2)	26/31 (83.9)	25/29 (86.2)
College or more	10/10 (100.0)	5/5 (100.0)	26/30 (86.7)	27/31 (87.1)
Unknown	---	1/1 (100.0)	---	---
Total	119/131 (90.8)	76/89 (85.4)	102/138 (73.9)	111/135 (82.2)

Table 103 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in District 9-2 vary with level of maternal educational attainment.

Table 104:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 9-2

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	54/62 (87.1)	56/81 (69.1)	82/103 (79.6)
Non-Medicaid	22/27 (81.5)	46/57 (80.7)	29/32 (90.6)
Total	76/89 (85.4)	102/138 (73.9)	111/135 (82.2)

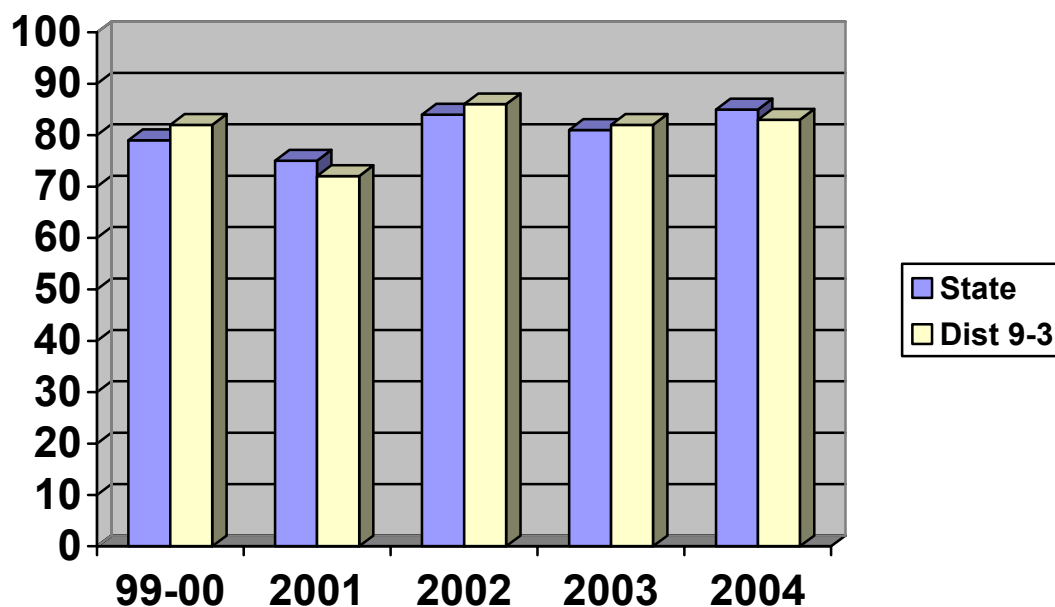
- ❖ Table 104 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. The immunization status of the children in District 9-2 varied with maternal Medicaid status.

Individual Health District Report: District 9-3

The eligible sample from this district included 117 children born in January 2002. From the 117 children, 84 records were located (Response Rate=71.8%). Of the 84 located records, there was 1 parental refusal leaving a final sample of 83 records.

- ❖ **The 4:3:1 immunization coverage estimate is 83.1 percent (69/83).** This rate is lower than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 21: 4:3:1 Coverage for State and District 9-3



- ❖ **The 4:3:1+3 immunization coverage estimate is 79.5 percent (66/83).** This rate is lower than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 105:
District Immunization Rates for
Health District 9-3 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	82.2%	71.6%	85.6%	83.0%	83.1%
3 OPV/IPV	86.3%	76.8%	89.8%	89.4%	88.0%
1 MMR	87.7%	80.0%	87.3%	89.4%	89.2%
3 Hib	89.0%	81.1%	91.5%	89.4%	84.3%
3 HepB	87.7%	81.1%	89.0%	86.2%	86.7%
1 Varicella	57.5%	69.5%	83.9%	86.2%	88.0%
3 PCV	---	---	---	---	41.0%
4 PCV	---	---	---	---	15.7%

*PCV data not collected before 2004.

Table 105 reveals the coverage rates of each vaccine series. Coverage rates ranged from 15.7 to 89.4 percent for the 2004 study data.

Table 106 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. As shown in the following table, the percentage of children vaccinated for DTP/DTaP decreases by dose. Similarly, the Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 106:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 9-3

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	77	92.8%
DTP2/DTaP2	72	86.7%
DTP3/DTaP3	67	80.7%
DTP4/DTaP4	0	0.0%
DTP5/DTaP5	0	0.0%
OPV/IPV1	77	92.8%
OPV/IPV2	72	86.7%
OPV/IPV3	35	42.2%
OPV/IPV4	0	0.0%
MMR1	3	3.6%
MMR2	0	0.0%
HIB1	76	91.6%
HIB2	70	84.3%
HIB3	29	34.9%
HIB4	1	1.2%
HIB5	0	0.0%
HEPB1	77	92.8%
HEPB2	73	88.0%
HEPB3	37	44.6%
HEPB4	1	1.2%
VAR1	3	3.6%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 83

Table 107:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 9-3 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	47/67 (70.1)	61/70 (87.1)	51/62 (82.3)	41/49 (83.7)
Black	21/28 (75.0)	39/46 (84.8)	21/29 (72.4)	26/31 (83.9)
Other	---	1/1 (100.0)	3/3 (100.0)	2/3 (66.7)
Unknown	---	0/1 (0.0)	---	---
Total	68/95 (71.6)	101/118 (85.6)	75/94 (79.8)	69/83 (83.1)

Table 107 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 107 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rate of children born to white mothers was similar to that of black mothers.

Table 108:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 9-3 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	7/8 (87.5)	3/3 (100.0)	---	1/1 (100.0)
Some high school	15/23 (65.2)	26/29 (89.7)	15/17 (88.2)	9/13 (69.2)
High school graduate	23/31 (74.2)	38/48 (79.2)	25/35 (71.4)	34/41 (82.9)
Some college	15/21 (71.4)	22/24 (91.7)	15/17 (88.2)	8/9 (88.9)
College or more	8/12 (66.7)	9/11 (81.8)	20/25 (80.0)	17/19 (89.5)
Unknown	---	3/3 (100.0)	---	---
Total	68/95 (71.6)	101/118 (85.6)	75/94 (79.8)	69/83 (83.1)

Table 108 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in the sample in District 9-3 seems to increase with educational attainment.

Table 109:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 9-3

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	64/73 (87.7)	43/60 (71.7)	42/51 (82.4)
Non-Medicaid	37/45 (82.2)	32/34 (94.1)	27/32 (84.4)
Total	101/118 (85.6)	75/94 (79.8)	69/83 (83.1)

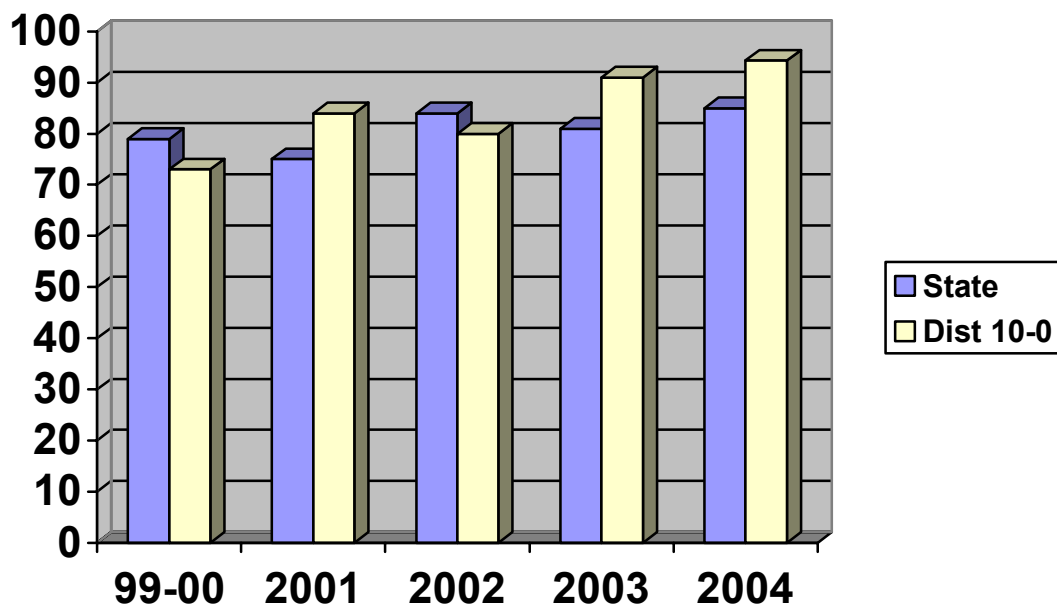
Table 109 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. The immunization status of the children in the sample in District 9-3 varies with maternal Medicaid status.

Individual Health District Report: District 10-0

The eligible sample from this district included 100 children born in January 2002. From the 100 children, 93 records were located (Response Rate=93.0%). Of the 93 located records, there were 5 parental refusals leaving a final sample of 88 records.

- ❖ **The 4:3:1 immunization coverage estimate is 94.3 percent (83/88).** This rate is higher than the statewide 4:3:1 immunization rate of 85.1 percent.

Figure 22: 4:3:1 Coverage for State and District 10-0



- ❖ **The 4:3:1+3 immunization coverage estimate is 86.4 percent (76/88).** This rate is higher than the statewide 4:3:1+3 immunization rate of 81.3 percent.

Table 110:
District Immunization Rates for
Health District 10-0 by Study Year*

Vaccine	1999-00 Adequate Rates	2001 Adequate Rates	2002 Adequate Rates	2003 Adequate Rates	2004 Adequate Rates
4 DTP/DTaP	74.7%	85.1%	80.2%	93.2%	94.3%
3 OPV/IPV	76.0%	88.3%	86.0%	93.2%	98.9%
1 MMR	77.3%	89.6%	90.1%	93.8%	97.7%
3 Hib	79.9%	94.2%	86.8%	95.7%	95.5%
3 HepB	79.9%	91.6%	88.4%	95.1%	94.3%
1 Varicella	55.8%	87.0%	86.8%	95.7%	94.3%
3 PCV	---	---	---	---	60.2%
4 PCV	---	---	---	---	25.0%

*PCV data not collected before 2004.

Table 110 reveals the coverage rates of each vaccine series. Vaccine coverage rates ranged from 25.0 to 98.9 percent for the 2004 study data.

Table 111 shows the immunization rates for each individual vaccine at twelve months of age. Not all shots are recommended prior to the first birthday; therefore, certain immunization rates within each series are expected to be low. For example, the DTP/DTaP vaccine series includes 4 doses before the second birthday; however, only three of the four shots are recommended within the first year of life. The Advisory Committee on Immunization Practices (ACIP) does not recommend the initiation of the MMR and Varicella vaccine series until after the first birthday, so these rates should be close to 0% at 12 months.

Table 111:
2004 District Immunization Rates by Individual Vaccine at
12 Months of Age for Health District 10-0

Vaccine Dose	Number Immunized	Percent*
DTP1/DTaP1	88	100.0%
DTP2/DTaP2	88	100.0%
DTP3/DTaP3	86	97.7%
DTP4/DTaP4	1	1.1%
DTP5/DTaP5	0	0.0%
OPV/IPV1	88	100.0%
OPV/IPV2	88	100.0%
OPV/IPV3	43	48.9%
OPV/IPV4	0	0.0%
MMR1	2	2.3%
MMR2	0	0.0%
HIB1	88	100.0%
HIB2	88	100.0%
HIB3	33	37.5%
HIB4	0	0.0%
HIB5	0	0.0%
HEPB1	87	98.9%
HEPB2	86	97.7%
HEPB3	35	39.8%
HEPB4	2	2.3%
VAR1	4	4.5%
VAR2	0	0.0%

*Percent = number immunized / sample size
Sample size = 88

Table 112:
Cross tabulations of Maternal Race and
Child Immunization Status for Health District 10-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Race	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
White	98/118 (83.1)	69/88 (78.4)	111/127 (87.4)	63/65 (96.9)
Black	32/35 (91.4)	26/31 (83.9)	23/30 (76.7)	18/21 (85.7)
Other	0/1 (0.0)	1/1 (100.0)	4/5 (80.0)	2/2 (100.0)
Unknown	---	1/1 (100.0)	---	---
Total	130/154 (84.4)	97/121 (80.2)	138/162 (85.2)	83/88 (94.3)

Table 112 contains a cross tabulation of maternal race and children's immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ Table 112 shows that the number of white mothers was more than the number of black mothers. The table also shows that the immunization rates of children vary with maternal race.

Table 113:
Cross tabulations of Maternal Educational Level and
Child Immunization Status for Health District 10-0 by Study Year

	2001 4:3:1 Adequate	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Educational Level	#/Total (percent)	#/Total (percent)	#/Total (percent)	#/Total (percent)
Less than high school	14/18 (77.8)	5/7 (71.4)	---	---
Some high school	28/32 (87.5)	25/29 (86.2)	26/32 (81.3)	12/14 (85.7)
High school graduate	48/59 (81.4)	35/47 (74.5)	45/59 (76.3)	29/32 (90.6)
Some college	23/26 (88.5)	12/14 (85.7)	28/31 (90.3)	18/18 (100.0)
College or more	17/19 (89.5)	20/23 (87.0)	39/40 (97.5)	24/24 (100.0)
Unknown	---	0/1 (0.0)	---	---
Total	130/154 (84.4)	97/121 (80.2)	138/162 (85.2)	83/88 (94.3)

Table 113 shows the cross tabulation of maternal educational attainment and 4:3:1 immunization status. The top row in each cell shows the number of mothers in each group whose children were adequately immunized and the total number of mothers in that group. The bottom row represents the percent that corresponds to those numbers (percent of each group that was adequately immunized).

- ❖ The immunization status of the children in District 10-0 seem to increase with maternal educational attainment.

Table 114:
Cross tabulations of Maternal Medicaid Status and
Child Immunization Status for Health District 10-0

	2002 4:3:1 Adequate	2003 4:3:1 Adequate	2004 4:3:1 Adequate
Maternal Medicaid Status	#/Total (percent)	#/Total (percent)	#/Total (percent)
Medicaid	47/59 (79.7)	71/86 (82.6)	39/43 (90.7)
Non-Medicaid	50/62 (80.6)	67/76 (88.2)	44/45 (97.8)
Total	97/121 (80.2)	138/162 (85.2)	83/88 (94.3)

Table 114 shows immunization status of children born to women stratified by Medicaid status for the 2002, 2003 and 2004 study years. For Health District 10-0, children born to non-Medicaid women had a higher immunization rate than children born to women using Medicaid.

Section V:

Discussion of Results

Section V: Discussion

Summary

The purpose of the eighth year of the Georgia Immunization Study (GIS) was to assess the statewide and district-specific immunization coverage rates of two-year-old children who received immunizations from both public and private providers in Georgia in 2004. To assess these rates, the study drew an original sample of 4,116 children born in January 2002. The final sample of returned immunization records totaled 4,116. After removal of ineligible children (those deceased, adopted, moved out of state, born in military hospitals) the eligible sample was 3,888. Of these, 2,645 were located and make up the final sample.

The eighth year of the GIS, 2004, measured immunization coverage for children born in 2002 at three levels:*

- 4:3:1+3 coverage, defined as 4 DTaP, 3 OPV/IPV, 1 MMR, 3 Hib, 3 Hep B, and 1 Varicella
- 4:3:1 coverage, defined as 4 DTaP, 3 OPV/IPV, and 1 MMR
- 3:3:1 coverage, defined as 3 DTaP, 3 OPV/IPV, and 1 MMR

Of these three coverage levels, 4:3:1+3 coverage rates were lowest and 3:3:1 rates the highest. The 4:3:1 measure was used most frequently throughout the study. Although complete 4:3:1 coverage is not considered adequate by the childhood immunization schedule currently recommended, coverage rates have traditionally been calculated using the 4:3:1 measure. Continuing to use this measure for most of the analyses allowed for comparison of data collected in 1999-00, 2001, 2002, 2003 and 2004. The newer 4:3:1+3 measure of coverage was added in 1997-98. Therefore, 4:3:1+3 rates can be compared using study data from the 1997-98 on.

*It must be remembered that the 2004 study is estimating 2002 rates. The 2003 study is estimating 2001 rates, 2002 study estimated 2000 rates, 2001 study estimated 1999 rates, and the 1999-00 study estimated rates for 1998.

The 2004 results reflect immunization rates for children born in 2002. The results of the study indicate that, of the 2,645 children whose immunization records were located during data collection:

- 81.3 percent of children born in January of 2002 in Georgia were adequately immunized with the 4:3:1+3 vaccine series.
- 84.5 percent of children born in January of 2002 in Georgia were adequately immunized with the 4:3:1 vaccine series, compared to 80.8 percent of children born in January of 2001, 83.9 percent of children born in January of 2000, 75.1 percent of children born in January of 1999, and 78.8 percent of children born in November of 1997.

4:3:1 immunization rates in the individual health districts ranged from

- 65.1 percent to 100 percent in the 2004 study
- 66.0 percent to 94.7 percent in the 2003 study
- 73.9 percent to 94.3 percent in the 2002 study
- 42.4 percent to 94.8 percent in the 2001 study
- 60.7 percent to 94.5 percent in the 1999-00 study

The study investigated where the immunizations are being administered in Georgia (See Appendix E). In the eighth study year, 70.1 percent of the shots found were given by private providers.

Furthermore, the findings may serve to guide future immunization assessments, as well as to highlight areas for additional research.

Conclusions

Immunization rates for the 4:3:1+3 vaccine series increased from the 2003 study (74.3 to 81.3). The 2004 Georgia Immunization Study (GIS) measured Varicella rates for the seventh year. From one perspective, the rates represent a success for the Georgia Immunization Program and the health districts. Measurement of rates for a new vaccine series has to begin at some time. The collection of data on 4:3:1+3 rates from the first point at which these rates became available (i.e. the 1997-98 Georgia Immunization Study) will allow public health staff to survey trends and monitor rates.

In reviewing the 4:3:1 vaccine series, rates increased statewide from the 2003 study (80.8 percent) to 84.5 percent in 2004.

The results of the previous four years of the GIS study (1999-00, 2001, 2002 and 2003) show that immunization-specific coverage rates for the state remained relatively similar during the years when all shots were given, 1997-1998, 1996-97 and 1995-96, respectively.

Strengths

1. This study represents Georgia's eighth successful statewide, population-based assessment of immunization coverage rates. The sampling methodology for the study was originally developed by Dr. Joan Herold, Demographer/Survey Specialist at Emory University. The sample sizes fulfill the power and accuracy requirements for the data analyses.
2. The stratification of the sample by health district, allows for the calculation of district level immunization rates.
3. In the absence of a statewide registry, the study represents the current "state of the art" in this research area. The methodology allowed for analysis of these useful data:
 - Determination of where the shots are given, either public or private provider. (See Appendix E: Provider of Immunizations). Former immunization audits in Georgia have looked at rates of public providers alone.

- Assessment of immunization status based on the most recent recommended 4:3:1+3 vaccine series.
 - Comparison of rates for children born in 1997, 1999, 2000, 2001 and 2002 in Georgia.
4. As a measure of reliability for the data entry process, double data entry was conducted on 5 percent of all records entered. The data entry error rate is approximately 4 percent for the 2004 study.

Limitations

The following sections describe important limitations of the study that should be considered when interpreting study results.

1. There were three limitations related to sampling. First, although the study included a random sample of children born in January 2002 and, thus, represented a generalizable estimate of coverage rates for all two-year-olds born in 2002, it could not account for variations that may routinely occur in other months of the year. Second, limiting the sample to children born in one month does not form the basis of a surveillance system capable of detecting changes in the health care system. Third, there may be children in the eligible sample who were erroneously included in the eligible sample and listed as not located. Examples of this type of error would be cases where a child died, was adopted, or was part of a military family, but the child's ineligibility related to these circumstances never became known to the study participants because the child could not be found. Although public health representatives were trained to follow the same protocol, each worked independently with limited supervision and may have deviated from the stated protocol in order to obtain all of the information.
2. Each year of the study fewer records were found in the public health system and consequently more parents had to be located. Parents in the Northern and Metro Atlanta Districts more often refused to participate (District 1-2, 3-2 and 3-4). Response rates tended to be lower in the Metro area (District 3-2, 3-3 and 3-5).

APPENDIX A:

**DESCRIPTION OF SAMPLING PLAN
AND STATISTICAL NOTE**

APPENDIX A: DESCRIPTION OF SAMPLING PLAN AND STATISTICAL NOTE

The target population for this study was children born in the state of Georgia in 2002 who were residing in the state in 2004. Children who were born in Georgia to mothers who were not Georgia residents were excluded, since Georgia was not responsible for the health care of these children. Children born on military bases were excluded because they fall under their own health care system and their immunization records were not obtainable. Those who died or moved out of state before their second birthday were also excluded because Georgia was no longer responsible for their immunization status. Adopted children were excluded because they were untraceable.

The sampling frame for the study was all infants born in January 2002 in the state of Georgia who were born to Georgia residents, not in military hospitals, and who survived until their first birthday. This choice of sampling frame assumes no seasonality in birth coverage or exposure to immunizations in the state in 2002. From this sampling frame, independent random samples of birth certificate data were drawn for each health district in Georgia, in accordance with the required sample sizes. At the time of sample selection, children born in military hospitals and children known to have died within the first year of life were eliminated from the sampling frame. However, it was impossible to eliminate from the sampling frame children born to military families who were not born in a military hospital, children who were adopted, and children who died after the first year of life or who moved out of state during 2004. Thus, these exclusions were made after sample selection. It can be assumed that the elimination of these records after sample selection did not have a significant effect on the random nature of the sampling because of the very small percentage they represented of the total population.

For a description of sample sizes, see Table 115: Data Used for Sample Size Estimates for the 2004 Study. Response rates and immunization coverage levels from the 2003 study were used in the sample size calculation for the 2004 study. The sample sizes were adjusted for small population size. The desired

sample size was then increased by a factor equivalent to the non-response rate (non-locatable immunization records) for each district from the 2003 study. The final calculated sample size is shown in the last column (Column H) of Table 115. This is the number of birth records statewide and per health district used as a result of this calculation for the study.

At the end of the study, response rates (located immunization records) varied from a low of 38.9 percent to a high of 95.2 percent, with the average response rate for the state at 68.0 percent. The state level data are based on a sample stratified by health district, with differing probabilities of selection. Therefore, the district data were weighted in order to provide more accurate, weighted estimates for the state level coverage rates.

Table 115:
Data Used for Sample Size Estimates
for the 2004 Study

A	B	C	D	E	F	G	H
Health District	Jan 2002 Total Births	Jan 2002 Eligible Births	2003 4:3:1 Immunization Rates	2004 First Sample Estimate	2004 Second Sample Estimate	Return Rate based on 2003 Eligible Sample	2004 Adjusted Sample Size
1-1	710	703	0.775	268	194	0.783	248
1-2	524	521	0.856	189	139	0.959	145
2-0	657	655	0.947	77	69	0.945	73
3-1	993	989	0.752	287	222	0.688	323
3-2	1,126	1,118	0.681	334	257	0.361	712
3-3	373	367	0.784	260	152	0.788	193
3-4	1,123	1,115	0.9	138	123	0.73	169
3-5	889	879	0.66	345	248	0.563	440
4-0	758	752	0.836	211	165	0.661	249
5-1	168	168	0.933	96	61	0.989	62
5-2	540	532	0.833	214	152	0.789	193
6-0	572	566	0.862	183	138	0.926	149
7-0	446	442	0.764	277	170	0.593	287
8-1	277	274	0.919	114	81	0.961	84
8-2	453	450	0.74	296	178	0.91	196
9-1	377	372	0.773	270	156	0.898	174
9-2	412	409	0.812	235	149	0.952	157
9-3	309	309	0.819	228	131	0.855	153
10-0	427	426	0.907	130	99	0.914	109
State	11,134	11,047					4,116

Figure 23:
Explanations of Table 115
Data Used for Sample Size Estimates
For the 2004 Study

<u>Column A:</u>	Health District	District number.
<u>Column B:</u>	January 2002 Total Births	Given. Source: DHR Vital Statistics Office.
<u>Column C:</u>	January 2002 Eligible Births	
<u>Column D:</u>	2002 4:3:1 Immunization Rates	Given. Source: Georgia Birth Cohort Follow-up Study (2002).
<u>Column E:</u>	First Sample Estimate - 2004 Study	Formula Used: $3.8416 \times (D) (1 - D) / .0025$
<u>Column F:</u>	Second Sample Estimate - 2004 Study	Adjustment for small size district populations. Formula Used: $E / (1 + E/C)$.
<u>Column G:</u>	Estimated Return Rate (Based on 2003 Study)	Given. Source: Georgia Birth Cohort Follow-up Study (2002).
<u>Column H:</u>	Adjusted Sample Size - 2004 Study	Formula Used: (Column F) / (Column G)

APPENDIX B:

**LIST OF 2004 PUBLIC HEALTH REPRESENTATIVES
FOR THE
GEORGIA IMMUNIZATION STUDY**

APPENDIX B: LIST OF 2004 PUBLIC HEALTH REPRESENTATIVES FOR THE GEORGIA IMMUNIZATION STUDY

<u>Health District</u>	<u>Public Health Representative</u>
1-1	Gayle Brannon, R.N., B.S.N.
1-2	Patricia Mason Ann Vossen, R.N.
2-0	Sandy Moore, LPN Janie Dalton, R.N.
3-1	Joy Stymest Karen Dibling, R.N., B.S.N.
3-2	Georgia Goseer, R.N. Likesar McCray
3-3	Lisa Germany Freda Sheppard, L.P.N.
3-4	Brenda Crowe Gloria Melvin Stephanie Phillips
3-5	Joyce Hess, R.N.
4-0	Tina Dempsey, L.P.N. Deborah Cox, L.P.N. Amy Fenn, RN
5-1	Donna Forth, R.N.
5-2	Debbie Liby, R.N.
6-0	Melba McNorrill, R.N. Clois Witt, R.N., B.S.N.
7-0	Beverly Roberson, R.N., B.S.N.
8-1	Simple Singh, M.D, M.P.H Yugonda Thomas D. Geneine Godfrey, M.P.H.
8-2	Edward W. Sullivan Sue Dale
9-1	Susan Malone, R.N.
9-2	Betty Miller Jessie Jones Hollard Phillips, M.S. Doris Wilbon, B.S. Stacy Giles, R.N. JoAnn Deas, R.N. Pat Thomas, R.N.
9-3	Jennifer Foster, M.S. Deborah A. Dawson, R.N., B.S.N.
10-0	Dionne Hansey Barbie Bushey, R.N., C.P.N., M.P.H.

APPENDIX C:
DATA COLLECTION FORM

GEORGIA IMMUNIZATION STUDY 2004: TWO YEAR-OLD ASSESSMENT

A Collaboration between Georgia DHR, Division of Public Health and the Health Districts

Part A: Identifying Information

Tracking Information	Update Information
Code: «BCNum» District: «district» County: «County»	Infant's Name:
Infant LName: «Last» Mname: «Middle» Infant FName: «First»	Parent/Guardian's Name:
Gender: «Sex» DOB: «DoB»	Ever WIC Enrolled : Yes ___ No ___ Unknown ___
Address: «Street»	New Address:
City: «City» State: GA Zip: «Zip»	
Mother's Last Name: «Field11» First: «Field9»	New Phone Number(s): ()
Father's Last Name: «Field19» First: «Field17»	

Part B: Immunization History

VACCINES	DATE #1	DATE #2	DATE #3	DATE #4	DATE #5
DTP/DTaP (4)	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /
Administered by:	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK
OPV/IPV (3)	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /
Administered by:	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK
MMR (1)	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /
Administered by:	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK
Hib (3)	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /
Administered by:	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK
HEP-B (3)	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /	mm dd yr / /
Administered by:	HD Hosp./ MD UNK	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK
Varicella (1)	mm dd year / /	mm dd year / /	mm dd year / /	mm dd year / /	mm dd year / /
Administered by: or Hx	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK
PCV (4) (Pneumococcal Conjugate)	mm dd year / /	mm dd year / /	mm dd year / /	mm dd year / /	mm dd year / /
Administered by:	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK	HD MD UNK

Part C: Data Collection

<p>A. Health Department</p> <ol style="list-style-type: none"> 1. All immunizations complete (END) 2. Child ineligible (go to D) 3. No record of the child (go to B) 9. Incomplete Immunizations (go to B) <p>B. Parent</p> <ol style="list-style-type: none"> 1. All immunizations complete (END) 2. Child ineligible (go to D) 3. Parent refused (END) 4. Parent moved to another health district Write new address in the upper right space (Send to state) 5. Parent not found (go to C) 6. Parent failed to follow up (go to C) 9. Incomplete immunizations (go to C) 	<p>C. Physician</p> <ol style="list-style-type: none"> 1. All immunizations complete (END) 2. Child ineligible (go to D) 3. Physician refused (go to E) 4. Physician not found (go to E) 5. Record not found (go to E) 6. Physician not known (go to E) 9. Incomplete immunizations (go to E) <p>D. Reason Ineligible</p> <ol style="list-style-type: none"> 1. Child died (END) 2. Parent in military (END) 3. Parent moved out of state (END) 4. Child adopted (END)
<p style="text-align: center;">Approved Abbreviations</p> <p>HD = Health Department PC = Phone Call MD = Physician TU = Thank You Hosp. = Hospital UNK = Unknown Hx = History of Varicella Disease, record the date.</p>	<p>E. Incomplete Immunization Due to:</p> <ol style="list-style-type: none"> 1. Religious reasons (END) 2. Medical reasons (END) 3. Other – Specify _____ (END) 4. Unknown (END)

Part D: Tracking Log – Description of Contact Activity

CONTINUE PART D ON THE BACK OF THIS FORM AS NECESSARY

Print Name of Public Health Rep. who completed form:	Date completed	Signature of Public Health Rep. who completed form:
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APPENDIX D:

**VARICELLA VACCINE AND
CHICKEN POX DATA**

APPENDIX D: Varicella Vaccine and Chicken Pox Data

Table 116 elaborates on the information found on the Varicella vaccine as well as information with regard to chicken pox. The results of this study have considered a child immunized for Varicella if the vaccine was administered anytime before or during the data collection period.

The table below demonstrates the utilization of the Varicella vaccine results in two ways. The first column describes the Varicella results had the two-year cut off been applicable. The second column depicts the Varicella results without the two-year restriction. The Varicella vaccination rates that report vaccination within the first two years of a child's life are lower than the Varicella vaccination rates that report vaccination at any point in time during the data collection period. These rates have not been adjusted for children who had natural Varicella immunity due to the chicken pox.

The final column describes the frequency of cases of chicken pox by district. A child's chicken pox status was provided by health department records, parents, or physicians. The percent column is equal to the number of children who had chicken pox divided by the district's final sample size.

Table 116:
2004 Varicella Rates and
Cases of Chicken Pox by District

Health District	Varicella shot by age 2		Varicella shot anytime (by end of data collection)		Had chicken pox at anytime (by end of data collection)	
	Number	Percent	Number	Percent	Number	Percent
1-1	188	86.2	194	89.0	0	0.0
1-2	93	91.2	97	95.1	0	0.0
2-0	64	95.5	66	98.5	1	1.5
3-1	171	80.7	177	83.5	1	0.5
3-2	180	79.6	184	81.4	1	0.4
3-3	60	69.8	64	74.4	0	0.0
3-4	143	93.5	144	94.1	1	0.7
3-5	207	86.6	214	89.5	0	0.0
4-0	154	82.4	159	85.0	0	0.0
5-1	46	83.6	50	90.9	0	0.0
5-2	129	87.8	134	91.2	1	0.7
6-0	104	89.7	110	94.8	0	0.0
7-0	177	88.9	186	93.5	0	0.0
8-1	70	92.1	70	92.1	0	0.0
8-2	168	96.0	171	97.7	0	0.0
9-1	80	98.8	80	98.8	0	0.0
9-2	117	86.7	122	90.4	0	0.0
9-3	69	83.1	73	88.0	0	0.0
10-0	79	89.8	83	94.3	1	1.1
Statewide	2,299	86.9	2,378	89.9	6	0.2

Figure 24: 2004 State Varicella Coverage Rates and Percentage of Sample with Chicken Pox Disease

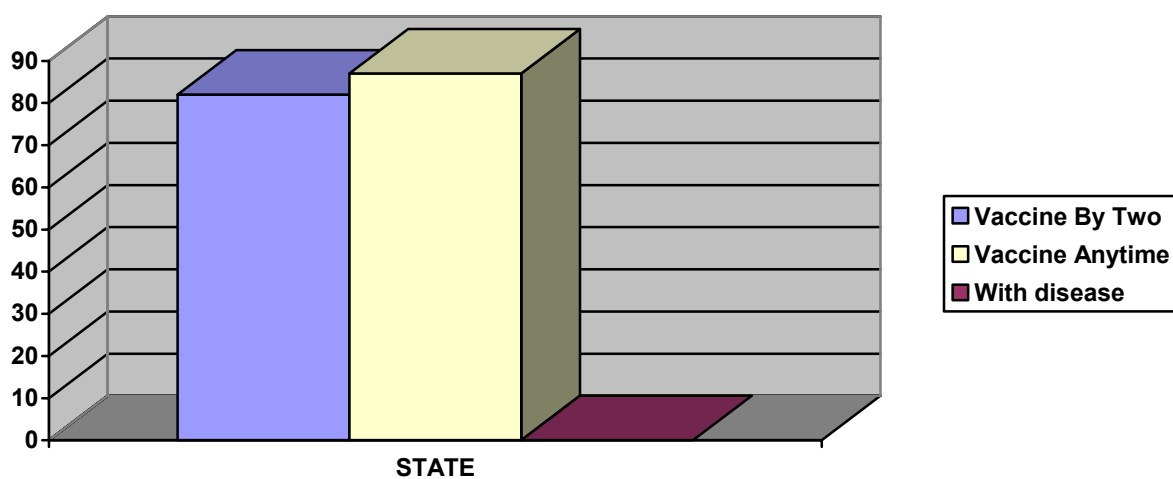


Figure 24 depicts the Varicella rate by the age of two years and the Varicella rate without the two year cut-off (received Varicella shot at any time during the data collection period). The last bar indicates the percentage of children with documented chicken pox disease at any point in time.

Appendix E:
Provider of Immunizations

Appendix E: Provider of Immunizations

Information about the provider of the immunizations was collected by noting where the shots were given (Public Health, Private Health, or Both) and who provided the information (Health Department, Private Provider, or Parent). If there was no indication of who gave the individual shot, the location for that shot was classified as unknown. The total number and percentage of shots given at each of the provider categories is shown in Table 117.

Table 117:
Statewide Percentage of Shots by Provider: 1999-00, 2001, 2002, 2003, and 2004

Provider	1999-00		2001		2002		2003		2004	
	Total #	%	Total #	%	Total #	%	Total #	%	Total #	%
Public Health Dept	11,248	29.1	9,472	25.5	8,085	20.3	5,873	16.3	5,449	14.3
Private Physician	23,984	61.9	25,797	69.5	28,667	71.9	26,956	74.8	26,734	70.1
Unknown	3,503	9.0	1,866	5.0	3,112	7.8	3,205	8.9	5,966	15.6
Total	38,735	100.0	37,135	100.0	39,864	100.0	36,034	100.0	38,149	100.0

As shown in Table 117, in 2004, over 70% of the shots recorded for the sampled children were given by a private provider.

Location of Immunizations by District

Table 118 illustrates the distribution of immunizations among public and private providers for each health district. These data were generated by counting the total number of shots given in each health district by provider location.

Table 118:
District Specific Percentage of Shots by Provider 2004

District	Public Health Department		Private Physician		Unknown		Total Shots Given
	# Shots Given	Percent	# Shots Given	Percent	# Shots Given	Percent	
1-1	251	8.0	2,327	73.9	569	18.1	3,147
1-2	213	14.4	1,129	76.2	139	9.4	1,481
2-0	157	15.2	879	85.4	3	0.2	1,029
3-1	464	16.0	1,238	42.6	1,205	41.4	2,907
3-2	744	24.8	1,838	69.4	411	13.7	2,993
3-3	146	12.8	791	69.4	202	17.7	1,139
3-4	45	0.6	2,203	95.5	57	2.4	2,305
3-5	306	8.9	1,558	45.7	1,545	45.3	3,409
4-0	279	10.6	1,340	50.9	1,009	38.3	2,628
5-1	104	13.2	598	76.1	83	10.5	785
5-2	346	20.1	1,336	61.8	480	22.1	2,162
6-0	260	14.8	1,484	85.0	1	0.0	1,745
7-0	511	25.9	2,408	71.5	48	2.4	2,967
8-1	252	22.1	868	77.6	18	1.5	1,138
8-2	318	11.9	2,291	86.0	52	1.9	2,661
9-1	140	11.3	1,077	87.4	14	1.1	1,231
9-2	742	38.3	1,175	60.6	20	1.0	1,937
9-3	44	7.2	1,015	88.8	83	3.8	1,142
10-0	127	9.4	1,179	88.6	27	1.8	1,332
State	5,449	14.3	26,734	70.1	5,966	15.6	38,149

In Year Seven:

- ❖ Seventeen health districts gave more than 50% of the shots in the Private sector.

Results by region:

- ❖ **North (Districts 1-1, 1-2, 2-0, and 10-0)**

In all of these districts private physicians gave the majority of the immunizations.

- ❖ **Metro Atlanta (Districts 3-1, 3-2, 3-3, 3-4, and 3-5)**

In the metro-Atlanta area more of the immunizations were administered in the private sector than in the public sector. District 3-1, Cobb County and District 3-5 had a high number of unknown shot locations (41.4 percent and 45.3, respectively).

- ❖ **Central (Districts 4-0, 5-1, 5-2, 6-0, 7-0)**

Children in all of the central districts received the majority of their shots at a private provider.

- ❖ **South (Districts 8-1, 8-2, 9-1, 9-2, 9-3)**

Private providers provided the majority of vaccinations in all health districts.

Four Year Comparison of Provider Information

The following table shows a comparison of results from the current year and the three previous years of the study. The comparisons reflect a movement of immunization services into the private sector in Georgia.

Table 119:
Location of Immunizations by District
Four Year Comparison
2001, 2002, 2003, and 2004

District	Public Health Department				Private Physician			
	2001	2002	2003	2004	2001	2002	2003	2004
1-1	26.5	20.3	16.4	8.0	65.7	73.2	66.9	73.9
1-2	16.0	13.7	16.2	14.4	81.3	66.9	81.0	76.2
2-0	20.3	24.3	25.2	15.2	75.9	75.0	73.0	85.4
3-1	18.9	19.1	18.4	16.0	55.3	54.4	42.2	42.6
3-2	28.7	24.0	32.1	24.8	48.9	56.5	48.2	69.4
3-3	20.2	26.6	5.4	12.8	66.2	59.1	90.7	69.4
3-4	3.1	7.4	2.1	0.6	96.9	87.9	97.9	95.5
3-5	22.0	11.7	11.6	8.9	75.7	86.4	73.5	45.7
4-0	25.4	19.9	19.7	10.6	74.2	76.5	64.0	50.9
5-1	43.7	29.9	23.1	13.2	52.5	69.0	74.1	76.1
5-2	44.9	26.7	22.2	20.1	51.4	66.2	73.9	61.8
6-0	14.5	24.1	6.4	14.8	84.9	74.6	89.7	85.0
7-0	36.1	22.8	21.7	25.9	63.8	77.1	76.8	71.5
8-1	30.6	20.5	22.4	22.1	69.3	78.7	77.6	77.6
8-2	29.6	22.8	11.7	11.9	70.4	73.9	62.2	86.0
9-1	16.7	17.5	9.2	11.3	81.1	78.2	86.0	87.4
9-2	53.9	36.4	32.6	38.3	45.5	59.7	66.4	60.6
9-3	23.6	16.9	6.2	7.2	75.7	82.2	93.8	88.8
10-0	19.7	19.9	14.7	9.4	80.1	80.1	79.6	88.6
State Totals	25.5	20.3	16.3	14.3	69.5	71.9	74.8	70.1

Four-Year Comparison: Summary of Table 119

In 2001	25.5% of the shots were received at the public health department 69.5% of the shots were given in the private sector 5.0% of the shot locations were unknown
In 2002	20.3% of the shots were received at the public health department 71.9% of the shots were given in the private sector 7.8% of the shot locations were unknown
In 2003	16.3% of the shots were received at the public health department 74.8% of the shots were given in the private sector 8.9% of the shot locations were unknown
In 2004	14.3% of the shots were received at the public health department 70.1% of the shots were given in the private sector 15.6% of the shot locations were unknown

APPENDIX F:

**MARGINS OF ERROR FOR
IMMUNIZATION COVERAGE RATES**

APPENDIX F: MARGINS OF ERROR FOR IMMUNIZATION COVERAGE RATES

Margins of error were calculated for all statewide and district immunization coverage rates, including 4:3:1+3 rates, 4:3:1 rates, and 3:3:1 rates. These margins of error can be found in Tables 120-122. The formula used to calculate the margins of error in these tables was:

$$\text{Margin of error} = \text{square root of: } \frac{(3.8416)(\text{imm rate})(1 - \text{imm rate})}{\text{Final sample size}}$$

Confidence intervals can be calculated using the margins of error. The constant 3.8416 is the chi-square value representing an error probability of less than 5%. Using the above formula for margin of error yields a 95% confidence interval for immunization rates. The interpretation of the 95% confidence interval for the state 4:3:1 immunization rate is as follows:

- ❖ With 95% confidence, the true statewide 4:3:1 immunization rate for infants born in 2002 is between 79.2 and 82.4 percent.

Due to the extensive analyses conducted for this report and the large number of rates reported, margins of error for specific rates were only calculated for the following:

- ❖ Statewide 4:3:1+3 immunization coverage rates
- ❖ Statewide 4:3:1 immunization coverage rates
- ❖ Statewide 3:3:1 immunization coverage rates
- ❖ District 4:3:1+3 immunization coverage rates
- ❖ District 4:3:1 immunization coverage rates
- ❖ District 3:3:1 immunization coverage rates

These margins of error and confidence intervals are noted in this appendix.

Table 120:
Margins of Error for 2004
Statewide and District 4:3:1+3 Rates

Health District	Sizes of Final Sample (Records Located)	4:3:1+3 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	218	79.4	+/- 5.4	74 – 84.8
1-2	102	85.3	+/- 6.9	78.4 – 92.2
2-0	67	100	+/- 0	100
3-1	212	73.1	+/- 6.0	67.1 – 79.1
3-2	226	75.2	+/- 5.6	69.6 – 80.8
3-3	86	62.8	+/- 10.2	52.6 – 73
3-4	153	91.5	+/- 2.8	93.9 – 99.5
3-5	239	74.9	+/- 5.5	69.4 – 80.4
4-0	187	74.9	+/- 6.2	68.7 – 81.1
5-1	55	80.0	+/- 10.6	69.4 – 90.6
5-2	147	83.7	+/- 6.0	77.7 – 89.7
6-0	116	85.3	+/- 6.4	78.9 – 91.7
7-0	199	82.9	+/- 5.2	77.7 – 88.1
8-1	76	89.5	+/- 6.9	82.5 – 96.5
8-2	175	93.1	+/- 3.8	89.3 – 96.9
9-1	81	97.5	+/- 3.4	94.1 – 100
9-2	135	78.5	+/- 7.0	71.5 – 85.5
9-3	83	79.5	+/- 8.1	75 – 91.2
10-0	88	86.4	+/- 7.2	79.2 – 93.6
Statewide Rate (weighted)	2,645	81.3	+/- 1.7	72.6 – 76

Table 121:
Margins of Error for 2004
Statewide and District 4:3:1 Rates

Health District	Sizes of Final Sample (Records Located)	4:3:1 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	218	82.6	+/- 5.0	77.6– 87.6
1-2	102	88.2	+/- 6.3	81.9 – 94.5
2-0	67	100	+/- 0	100
3-1	212	78.3	+/- 6.0	67.1 – 79.1
3-2	226	78.3	+/- 5.4	72.9 – 83.7
3-3	86	65.1	+/- 10.0	55.1 – 75.1
3-4	153	93.5	+/- 3.3	92.1 – 98.7
3-5	239	82.0	+/- 4.9	77.1 – 86.9
4-0	187	77.5	+/- 6.0	71.5 – 83.5
5-1	55	85.5	+/- 9.3	76.2 – 94.8
5-2	147	87.1	+/- 6.0	77.7 – 89.7
6-0	116	90.5	+/- 5.3	85.2 – 95.8
7-0	199	88.4	+/- 4.4	84 – 92.8
8-1	76	89.5	+/- 6.9	82.6 – 96.4
8-2	175	94.9	+/- 3.3	91.6 – 98.2
9-1	81	97.5	+/- 3.4	94.1 – 100
9-2	135	82.2	+/- 6.5	75.7 – 88.7
9-3	83	83.1	+/- 8.1	75 – 91.2
10-0	88	94.3	+/- 4.8	89.5 – 99.1
Statewide Rate (weighted)	2,645	85.1	+/- 1.6	79.2 – 82.4

Table 122:
Margins of Error for 2004
Statewide and District 3:3:1 Rates

Health District	Sizes of Final Sample (Records Located)	3:3:1 Immunization Coverage Rates (percent)	Margins of Error (percent)	95% Confidence Intervals (percent)
1-1	218	86.7	+/- 4.5	82.2 – 91.2
1-2	102	92.2	+/- 5.2	87 – 97.4
2-0	67	100	+/- 0	100
3-1	212	82.1	+/- 5.2	76.9 – 87.3
3-2	226	82.3	+/- 5.0	77.3 – 87.3
3-3	86	68.8	+/- 7.1	79.5 – 93.7
3-4	153	95.4	+/- 3.3	92.1 – 98.7
3-5	239	86.2	+/- 4.4	81.8 – 90.6
4-0	187	80.7	+/- 5.7	75 – 86.4
5-1	55	90.9	+/- 7.6	83.3 – 98.5
5-2	147	91.8	+/- 4.4	87.4 – 96.2
6-0	116	93.1	+/- 4.6	88.5 – 97.7
7-0	199	91.0	+/- 4.0	87 – 95
8-1	76	90.8	+/- 6.5	84.3 – 97.3
8-2	175	96.6	+/- 2.7	93.9 – 99.3
9-1	81	98.8	+/- 2.4	96.4 – 101.2
9-2	135	87.4	+/- 5.6	81.8 – 93
9-3	83	86.7	+/- 7.3	79.4 – 94
10-0	88	97.7	+/- 3.1	94.6 – 100.8i
Statewide Rate (weighted)	2,645	88.5	+/- 1.3	84.6 – 87.2